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INCLUDING

CEYLON AND BURMA.

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HYMENOPTERA—Vol. III.

ICHNEUMONIDÆ:—I. Ichneumones Deltoidei.

BY

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* No Indian species are described in this volume.

AUTHOR'S PREFACE.

So long ago as 1903, W. T. Blanford remarked that it was not proposed to proceed for the present with the publication of the remainder of the Hymenoptera of British India; but considering the peculiar interest and economic importance of the ICHNEUMONIDÆ, it was to be hoped that an account of them would appear at some future time. He added that our knowledge of this group was then less perfect than that of the Aculeata, a statement which is still very true. In January, 1908, the succeeding editor, Lt.-Col. C. T. Bingham, asked me to prepare a volume on this interesting family; and I have herein compiled to the best of my ability, though the task of bringing into tabular form genera and species described in six languages throughout an extremely scattered literature has not been light. The published species of Indian ICHNEUMONIDÆ were computed by H. Maxwell Lefroy to number two hundred and eighty-eight in 1909, showing how little had been attempted in this direction; and the amount left to be done truly appeared appalling from the same author's statement ('Indian Insect Life,' p. 178) that "nothing is on record as to the hosts of these species and the forms occurring in India are practically unknown."

What was already achieved in this direction, however, proved upon investigation of the literature to be both somewhat extensive—nearly two hundred papers bearing upon the subject will be found under "Authors Consulted"—and

utterly useless to any scientific student. Every systematic author (and they were few) had, without exception, chosen to regard this unexplored field as zoologically distinct, a thing apart, and consequently nearly every species dealt with was regarded as being new to Science. This predisposition doubtless caused Lefroy (*l. c.* 177) to pronounce that the "species are of limited distribution, confined to distinct areas, and the Indian forms are, so far as known, confined to this geographical region," by which he doubtless referred to British India. This, however, is not a single zoological region; on the contrary, the Palæarctic Region comprises all temperate Europe and Asia, its southern boundary being somewhat indefinite, though it is advisable to comprise in it all Afghanistan, Baluchistan, and the Punjab; and it comes down to a little below the upper limit of forests in the Himalayas. It has been said that this region differs from the Oriental by negative characters only; a host of the tropical families and genera being absent, while there is little or nothing but peculiar species to characterise it absolutely. The Oriental Region consists of all India from the limits of the Palæarctic Region, Indo-China and all the Malay peninsula and islands as far east as Java and Bali. The subdivisions of the Oriental Region are:—(1) the Central Indian, which in all its essential features is wholly Oriental in its fauna; (2) the Ceylonese, comprising Ceylon and the southern extremity of India: this is a mountainous forest region, and possesses several peculiar forms as well as some Malayan types not found in the first subregion; (3) the Indo-Chinese subregion, comprising South China, Siam and Burma, extending westward along the Himalayan range to an altitude of about nine or ten thousand feet, and southward to Tenasserim; and (4) the Malayan ('The Geographical Distribution of Animals,' by Alfred Russel Wallace, i, pp. 71–76). Hence we see no bar to the occurrence in the hills of northern, and especially north-western,

India of species common throughout Europe, and the fallacy of describing, without due investigation, new species from this district, as has not infrequently been done ; specimens of ICHNEUMONIDÆ from Simla and Darjiling very often agree exactly with those captured in my Suffolk garden ! At a meeting of the Entomological Society of London on 6th April, 1874, Frederick Smith read a paper on the ICHNEUMONIDÆ of Japan, and remarked "that, in his opinion, many of them represented well-known European species, although apparently distinct" ; and I have recently had the opportunity of showing that certain Japanese Ichneumons are identical with British species (Entom. 1910, p. 11). On the other hand, at least one common species, occurring from Bengal to Ceylon, has been also found in Queensland. Roughly speaking, south-east India tends to the Malay and north-west India to the European fauna; the intermediate overlapping is of unusual interest.

It were well to remind hasty describers of the truth enunciated by Agassiz, when he said, "The facility with which, in a new country, unknown animals can be described, and notoriety thus readily obtained, is a strong incentive to go on with descriptive work ; but it should not be forgotten that the true purpose of systematic work must be to increase our knowledge of the relationship of animals of any special group already known, and serve in some way as a connecting link in the chain of the various branches of zoology. Working in this spirit, systematic zoology helps us in our attempts to understand the laws of Nature; these must remain unintelligible to him who is busy with naming and classifying materials, reducing his science to an art, merely accumulating facts to be stored in museums, forming, as it were, a library of nature" ('American Naturalist,' Aug. 1871).

In the present volume I have treated of only three of the

five great groups or subfamilies into which the ICHNEUMONIDÆ are primarily divided, namely, the PIMPLINÆ, the species of which are of great size and comparatively easy to discriminate; the TRYPHONINÆ, which are very poorly represented, owing to the scarcity of their Tenthredinid hosts; and the OPHIONINÆ, which have probably been largely overlooked at present. That there will be found comparatively few species of this family in the vast extent of India, when adequately investigated, or at least that very few of them are abundant over extensive areas, I am led to believe, by the constant recurrence of the same species in every consignment received. That the ICHNEUMONINÆ and CRYPTINÆ are more diversified I am fully persuaded, and they are consequently reserved for a separate volume, since the intricacies of their structure and affinities need more exact investigation and expenditure of labour than could be bestowed upon them in the time available.

Material has been somewhat scanty, yet all-sufficient to render the two years mainly spent in the preparation of the present volume very busy ones. The specimens that have passed beneath my lens total several thousands, and constitute ten more or less distinct collections, emanating from Ceylon and Tenasserim to the northern Himalayas, and from Baluchistan and Peshawar to the Naga Hills of Eastern Assam. Lieut.-Col. Bingham first placed in my hands his collection, which was merged on his death with that of the British Museum, every specimen of which I have examined. Next came a large consignment from the Agricultural Research Institute at Pusa, in Bengal; Lieut.-Col. Nurse entrusted to my care the whole of the specimens amassed by him in the North-West districts; Mr. E. Ernest Green and Mr. O. S. Wickwar forwarded such specimens as they had captured in Ceylon; and Mr. T. Bainbrigge Fletcher kindly left his collection for me at the British Museum. Latterly, at my request,

Prof. E. B. Poulton and Dr. Gestro were so good as to send the Indian material from the Oxford and Genoa Museums respectively. Finally, a considerable collection has been received from the Indian Museum at Calcutta. I need not further here particularise these collections, since in every case I have referred the species under discussion to its source in the body of the volume. To the owners or keepers of the above material, and especially to Mr. Ernest A. Elliott, I here tender my sincere thanks for technical and academic assistance.

I am also indebted to Mr. J. H. Keys, of Plymouth, for his kind permission to reproduce three blocks (figs. 1, 2, and 3) from the first volume of my 'Ichneumonologia Britannica.'

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SUMMARY OF THE KNOWN INDIAN ICHNEUMONES-DELTOIDEI.

Tribes.	Genera.	Species.
Hemigastrides	4	9
Acænitides	8	12
Xoridides	7	22
Pimplides	25	105
Lissonotides	9	21
Banchides	6	14
PIMPLINÆ total	59	183
Metopiides	3	9
Sphinctides	1	1
Bassides	3	12
Exochides	9	18
Tryphonides	16	20
TRYPHONINÆ total	32	60
Paniscides	4	14
Ophionides	6	33
Nototrachides	1	2
Anomalides	10	29
Campoplegides	19	66
Cremastides	2	8
Pristomerides	2	3
Porizonides	2	3
Mesochorides	3	5
OPHIONINÆ total	49	163
TOTAL	140	406

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GLOSSARY.

Acetabula.—The sternal cup-like cavities, in which the coxæ revolve.

Aciculation.—A series of fine, close, longitudinal lines, as though scratched by the point of a needle.

Aculeate.—Furnished with a sting.

Acuminate.—Terminating in a sharp point.

Alutaceous.—Covered with minute cracks, like the human skin.

Anal.—Relating to the anus.

Annellus.—The minute third joint of the antennæ and first of the flagellum.

Annulated.—Ringed or banded (of colour).

Ante.—(In composition) Before.

Antennæ.—The feelers; two elongate, porrect organs of appreciation rising from the front of the head.

Anus.—The apex of the abdomen.

Apex.—That end of a segment or limb which is furthest from the base (*q. v.*).

Apical.—Relating to the apex.

Apodous.—Legless.

Apophyses.—(Gr. *apophuo*, an offshoot). The dorso-lateral metathoracic spines; it has been incorrectly employed to denote the apical joint of the trochanter (*trochanterellus*, Schm.) by Ratzeburg and Desvignes.

Apterous.—Wingless.

Arcuate.—Arched; curved like a bow.

Areated.—Bearing areæ.

Areola.—The central area of the metanotum; not used in reference to the wing.

Areolet.—The cubital cell of the front wing; areola, of various authors.

Armature.—Corneous parts of the genital organs, generally used of the male.

Articulated.—Jointed.

Attenuate.—Gradually tapering to a more or less distinct point.

Auriculate.—In the form of an ear.

Badious.—Blackish red, often infuscate; between castaneous and black.

Base.—The nearest part of any member to the central point of the body, namely, the point of juncture of the mesothorax with the scutellum.

Buccate.—Inflated; bulged out; cheeks are so termed when they form almost a right angle with the clypeus, viewed from in front.

Bulla.—The bulla of Jurine is the fenestra of Thomson (*q. v.*).

Calcaria.—The spines at the apex of the tibia.
Callosity.—A slight elevation or hump.
Callus.—A small callosity immediately before the radix of the fore-wings.
Canaliculate.—Furrowed; elongately impressed.
Carina.—A keel, ridge or elevated line.
Carinate.—Keel-like: with a raised ridge.
Castaneous.—Chestnut-red.
Caudate.—In the form of a tail.
Cheeks.—That part of the head between the base of the mandibles and lower margin of the eyes.
Chitinous.—Pertaining to chitin, of which the exo-skeleton of insects is composed; presenting a hard surface.
Ciliate.—Fringed with hairs or cilia, like an eye-lid.
Citrinous.—Bright lemon-yellow.
Clavate.—Clubbed.
Clypeus.—That part of the head between the face and the mouth.
Concolorous.—Of the colour last mentioned.
Connate.—Inflexibly soldered together.
Corbiculate.—Basket-shaped.
Cordiform.—Heart-shaped.
Coriaceous.—Presenting a surface like that of leather.
Corneous.—Horny.
Cornute.—Horned.
Costa.—A small elevated ridge; rarely used of the front edge of the wing.
Costula.—Exclusively used to denote the little costa separating the externo-medial metathoracic areæ into two parts.
Coxa.—The first or basal joint of the legs.
Cristula.—A little and usually elongate crest.
Cultriform.—Knife-shaped.

Declivous.—Running downwards.
Dentate.—Toothed.
Dentiparal.—Tooth-bearing.
Deplanate.—Depressed or flattened dorsally.
Disc.—The central region.
Discrete.—Separated, usually by an impressed line; in the case of the petiolar area it indicates that there are present two longitudinal carinæ which divide the area into three parts.

Edentate.—Without teeth.
Emarginate.—With the margin not continuous, generally centrally incised.
Entire.—Without excision, emargination or projection.
Epicnemia.—The elevated anterior margin of the mesosternum.
Epistoma.—The central, and often longitudinally elevated, portion of the face; Gravenhorst calls the whole front of the head, from the frons to the mandibles, the facies or hypostoma; Berthoumieu calls it the epistome or clypeus.

Epomiæ.—The elevated margins of an oblique furrow in the propleuræ for the reception of the front femora.
Exareolate.—Without areæ.
Explanate.—Flatly expanded.

Face.—The area between the antennæ and clypeus, laterally bounded by the eyes.
Facies.—General aspect; superficial appearance.
Fascia.—A transverse coloured band.
Femur.—The third section and fourth joint of the legs; the thigh.
Fenestra.—A pellucid or interstitial point or space in a wing-nervure.
Ferruginous.—Rust-red; between red and castaneous.
Filiform.—Thread-like; of equal breadth throughout.
Flagellum.—That part of the antennæ beyond the scape, *i. e.* joints 3 to apex, the funiculus.
Flavidous.—Rather lighter or darker than flavous.
Flavous.—Somewhat pale yellow: between stramineous and fulvous.
Fovea.—A circular depression, usually of some size.
Foveola.—A small fovea, often distributed in series.
Frenum.—The transverse area on either side of the scutellum, extending to the radices.
Frons.—Forehead; the region of the head between the vertex and the face.
Fulvous.—Tawny-yellow, darker than flavous.
Fusiform.—Spindle-shaped; thickest centrally, narrowed towards both extremities.
Fuscous.—Tawny brown; between fulvous and piceous.

Gastrocœli.—The usually transverse foveæ on either side, near base of the second segment.
Genal.—Pertaining to the cheeks.
Geniculate.—Elbowed.
Gibbous.—Humped, strongly convex.
Glabrous.—Smooth and shining, usually with neither sculpture nor hairs.
Granulate.—Covered with small, round elevations.

Hamate.—Hooked.
Hirsute.—Covered with long hairs.
Humeral.—Relating to the shoulder, near the base of the wings.
Hypopygium.—The apical ventral segment of the abdomen.

Impunctate.—Without punctures.
Incisures.—Depressed lines of junction between the abdominal segments.
Incrassate.—Thickened.
Infumate.—Clouded with smoky colouring.
Infuscate—Clouded with fuscous colouring
Insertion.—Point of attachment of a movable part.

Intumescent.—Swollen, thickened.

Joints.—The articulations of the antennæ and legs; not used of the abdomen.
Juxta-.—(In composition) Near.

Labrum.—A chitinous plate lying between the bases of the mandibles, immediately before the clypeus.
Lanceolate.—Narrowly elliptical.
Lobate.—Bearing lobes.
Lunate.—Crescent-shaped.
Lunula.—The crescent-shaped spot often present at the vertical orbits; the small and circular glabrous area on the sides of the abdominal segments.

Maculate.—Spotted or marked.
Membranous.—Composed of thin semitransparent tissue.
Mesothorax.—The second and central section of the thorax.
Mesosulcus.—Central longitudinal furrow of mesosternum.
Metathorax.—The third and hind section of the thorax (for details, see p. 10).
Moniliform.—Like a string of beads; used of the antennæ.
Mucronate.—Prolonged into a sharp point.

Nervelet.—The stump of a nervure often present on the upper side of the internal orbital nervure, which in reality terminates in it.
Nigrescent.—Blackish.
Nitidulous.—Strongly shining.
Notauli.—The usually short, often absent, furrows on either side of the mesonotum in front, which were incorrectly termed parapsides by Holmgren.
Notum.—The upper surface of the thorax; that of the prothorax is the pronotum, or collar, &c.

Obsolete.—Traceable, though almost effaced.
Ocelli.—The three simple eyes, always present upon vertex of the head.
Occiput.—The back of the head, between the vertex and the collar.
Ochraceous.—Brownish-yellow.
Onychium.—The apical tarsal joint, bearing the onyches or claws.
Orbits.—The margins of the head round the eyes.
Oval.—Longer than broad, laterally rounded, with the extremities of equal breadth.
Ovate.—Longer than broad, laterally rounded, with the extremities of unequal breadth; egg-shaped.

Palpi.—Sensitive organs of appreciation, articulated and attached to the mandibles and labrum.
Parapsides.—Strongly declivous parts between the scutellum and tegulæ.
Pectinate.—Furnished with teeth, like a comb.

Pectoral.—Pertaining to the breast or sternum.

Pedicellus.—The minute second joint of the antennæ and apical of the scape.

Pellucid.—(Of nervures) semitransparent, ill-defined.

Petiole.—The narrow basal half of the first abdominal segment; peduncle; pedicle.

Phytophagous.—Plant-feeding.

Pilose.—Hairy; hairs longer than in pubescent, shorter than in hirsute.

Piceous.—Pitchy, dark brown; between fuscous and black.

Pleuræ.—The lateral surfaces of the thorax; those of the prothorax are the propleuræ, &c.

Plicate.—Furnished with a fold.

Plumbeous.—Lead-colour.

Postannellus.—The fourth joint of the antennæ and second of the flagellum.

Postscutellum.—The small rounded prominence between the scutellum and metanotum.

Prothorax.—The first and front section of the thorax.

Pubescence.—Very short, fine hairs, causing a downy appearance.

Pubescent.—Bearing pubescence.

Pulvillus.—The pad between the tarsal claws.

Punctate.—Covered with punctures, small circular pits.

Punctulate.—Covered with fine, often subobsolete punctures.

Pygidium.—The apical dorsal segment of the abdomen.

Pyriform.—Pear-shaped.

Quadrate.—Square.

Radius.—The radial nervure; the old authors used it for the costa of the fore wings.

Radix.—Base of the wings, and their point of insertion.

Ramellus.—The ramellus of Thomson is the nervelet (*q.v.*) of Stephens.

Reflexed.—Bent backwards; upturned.

Reniform.—Kidney-shaped.

Reticulate.—Covered with a network, like the human skin.

Rugose.—Irregularly and roughly wrinkled.

Rugulose.—Irregularly but not roughly wrinkled.

Scabrous.—Regularly and somewhat roughly wrinkled.

Scabriculous.—Regularly and finely wrinkled.

Scape.—The basal antennal joint; used collectively for the two basal joints, of which the pedicellus is very small.

Scopula.—A small, dense tuft of hair.

Scrobes.—The usually circular impressions upon the frons in which the scapes revolve.

Scutellum.—The usually triangular, raised area at the base of the thorax.

Scutum.—The mesonotum.

Segments.—The articulations of the abdomen; not used of the antennæ and legs.

Sericeous.—With recumbent silky pubescence.

Serrate.—Furnished with strong teeth, like a saw.

Sessile.—(Of the abdomen) broadly connected with thorax; in contradistinction to petiolate.

Seta.—An elongated, isolated bristle.

Setaceous.—Gradually tapering from base to apex, like a bristle.

Setigerous.—Bearing setæ.

Shagreened.—Unevenly glabrous; not smooth, but with sculpture obsolete.

Simple.—Bearing no peculiar modifications.

Sinuate.—Presenting a waved and undulating outline, less strong than emarginate.

Spatuliform.—Flattened out, deplanate; like a spatula.

Spicula.—The oviduct, or central organ of the terebra; of female only.

Spinose.—Bearing spines or isolated bristles.

Spinulose.—Bearing small, often indistinct, spines.

Spiracles.—A respiratory opening upon the surface of the body.

Sternauli.—The short, and often absent, furrows on either side of the mesosternum.

Sternum.—The lower surface of the thorax; that of prothorax is the prosternum, &c.

Stigma.—The corneous mass in the centre of the front margin of the fore wings.

Stramineous.—Straw-coloured; primrose-yellow; between white and flavous.

Striate.—Furnished with series of distinct impressed lines; stronger than aciculate.

Strigose.—Furrowed or wrinkled.

Striolate.—Furnished with large and deep aciculations; finer than striate.

Sub-.—In composition, diminishes the qualification.

Sulcus.—An impressed, elongate furrow.

Sulciform.—Resembling a sulcus.

Tarsus.—The apical section of the leg, next after the tibia; the foot; consisting of five distinct joints, of which the onychium bears two claws.

Tectiform.—Roof-shaped.

Tegula.—The cover of the wing-base; sqamulæ of various authors.

Terebra.—Ovipositor; borer; aculeus; the oviduct and sheaths collectively; of female only.

Testaceous.—Darkish yellow; between flavous and fulvous.

Thorax.—The trunk or middle section of the body, bearing the legs and wings; always divided into three parts, termed the pro-, meso-, and metathorax; the upper surface is the notum, the lower the sternum, and the lateral are the pleuræ (for details, see p. 10).

Thyridii.—The apical margin of the gastrocœli, often alone visible.

Tibia.—The fourth section of the leg, between the femur and the tarsus; the shin.

Tomentose.—Covered with short interwoven hairs or pile.

Trochanter.—The second section of the leg, between the coxa and femur; divided in all Ichneumonidæ into two joints, the apical of which is the trochanterellus.

Truncate.—Cut off in a straight line, neither sinuate nor curved.

Tubercle.—A small knob-like prominence.

Tuberculiform.—In the form of a tubercle.

Tumidulous.—Strongly convex.

Unicolorous.—Of a uniform colour throughout.

Valvulæ.—The branches of the genital forceps of the male; usually visible exteriorly, and liable to be mistaken for the terebra when that organ is short.

Ventral.—Pertaining to the lower surface of the abdomen.

Vertex.—Highest point; usually used of the head, in which it bears the ocelli.

Villose.—Clothed with long, raised, closely-set hairs.

Vittæ.—Streaks or bands of colour, usually on the mesonotum.

Vomeriform.—Ploughshare-shaped.

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INTRODUCTION.

History.

The Ichneumonidæ were first definitely separated from the remainder of the parasitic Hymenoptera by Professor Gravenhorst in 1829, when he published his 'Ichneumonologia Europæa,' wherein he limited the family to those Parasitica having strong wing-nervures, of which the second recurrent was very definitely present. He not only described the whole of the European species known to him in a collection of a hundred thousand specimens, but he also brought forward in a concise and easily assimilated form all that his predecessors had done in the subject, and gave detailed accounts of every published species unknown to himself. This work laid the foundation of our present knowledge of this family, and it is comparatively recently that we have to any appreciable extent dared to depart from the mode of classification therein laid down.

The peculiar difficulty experienced by the student of these parasites is the extreme similarity in structure of specimens which are obviously specifically distinct; and hence Gravenhorst relied in a great measure on colour, always an unsatisfactory guide, for his specific distinctions; indeed, such structural points as exist are so minute that their neglect by the earlier writers can readily be understood. As more and more workers bore their testimony, however, structure speedily took the place of colour in systematic works. The first subsequent author worthy of note was Prof. C. Wesmael, who contributed a monograph on the genus *Ichneumon* to the Brussels Academy in 1844; to this the same author added seven valuable supplements during the following fifteen years, and in 1849 he published a revision of Jurine's genus *Anomalon*. Where Wesmael left the subject, it was taken up by Holmgren, who considerably advanced our knowledge in his 'Ichneumonologia Suecica' of 1864–89. Gravenhorst had divided the family into five groups, and Holmgren elaborated the Ophioninæ in 1858, the Tryphoninæ in 1859, and the Pimplinæ in 1860, on structural characters.

Nothing had been done to elucidate the Cryptinæ, however, before 1865, when Taschenberg redescribed Gravenhorst's types in a somewhat perfunctory manner, excepting Dr. Arnold Förster's too elaborate Monograph of the genus *Pezomachus* in 1850; and some new species of the family were somewhat inadequately described about the same time by Ratzeburg from the German forests.

This was the position of matters when Prof. C. G. Thomson began to issue his great 'Opuscula Entomologica,' a work of the most amazing erudition and minutest observation; new genera were erected upon constant and beautifully natural characters, the affinities of groups and genera were exposed with the utmost acumen and the previous artificial, rule-of-thumb method of naming was swept away. His short papers in the 'Annales' of the French Entomological Society and the 'Deutsche Entomologische Zeitschrift' are of equally high merit. During the twenty-eight years that the 'Opuscula' occupied in production many workers had given their attention to the subject: in Germany, Brischke brought out an account of the Prussian species, Kriechbaumer had contributed many papers both upon Palæarctic and exotic groups, and Dr. Schmiedeknecht had monographed the CRYPTINÆ in the combined light of Thomson's and Carl Tschek's discoveries; in Holland, Van Vollenhoven had beautifully illustrated a great many species; in Britain, the Rev. T. A. Marshall had issued his 1872 Catalogue of the indigenous ICHNEUMONIDÆ, which enabled Bridgman and Fitch to contribute their Introductory Papers on the subject to the 'Entomologist'; while in 1896, Dr. Tosquinet presented his 'Ichneumonides d'Afrique' to the Entomological Society of Belgium, and the Abbé Berthoumien brought forward his general account of the ICHNEUMONINÆ of Europe and the adjacent countries in the French 'Annales.' During the same period Fred. Smith and Francis Walker, Motschulsky and Van Vollenhoven had described new kinds from Asia and Australia, and Cresson, Davis, and Ashmead had begun the task of elucidating this branch of the American fauna.

The present century was begun under the satisfactory conditions of a complete synopsis of the genera of ICHNEUMONIDÆ by W. H. Ashmead, which, though often faulty and not less frequently obscure, has proved invaluable to the general student; and Dalla Torre completed his synonymic Catalogue of the world's species, a work of even higher intrinsic worth, and one which gives a good idea of the extent to which the study of the ICHNEUMONIDÆ has now grown, as may be gathered from the fact that the mere names of the species there occupy over a thousand closely printed pages.

As regards India, Linnæus, De Geer, Fabricius, and several more of the old authors described a certain number of Ichneumons from there, though rarely in an exact manner; and we are often quite at a loss to recognise those brought forward by Brullé in his general account of 1846; additions to the Indian species were also made by Smith and Walker, but the latter frequently assigned his species to incorrect genera. But the great majority of the published species have been described by Peter Cameron, who has been most assiduous in this respect, and had his knowledge of the Palæarctic forms been commensurate with his zeal in bringing forward the Oriental, he would have already laid a very substantial foundation for future research. Unfortunately for

his successors, he was not prepared to regard India as a part of the world, but as a world apart, and each fresh kind that he saw from there was duly chronicled as a new species.* This practice has led to some chaos, though I have synonymised nearly all the Palæarctic forms which he has described as new, since the opportunity has been afforded me by Lt.-Col. Nurse and Lt.-Col. Bingham of examining the type specimens. But where the types have been inaccessible it is not infrequently quite impossible to tell what his insects were, since he habitually used no reference to standard authors, was vague respecting the basal and apical extremities of the thoracic segments, and so unintelligible in his account of the universally recognised terms for the metanotal areas and carinæ that I have occasionally been driven to reproduce his accounts of them verbatim. His earlier descriptions lack any but the vaguest venational characters, though in this respect his style improved in 1907, and his tables are often quite unreliable (*cf.* Ann. Mag. Nat. Hist. xx, 1907, p. 21). I have, too, in every instance found it necessary entirely to rewrite his descriptions, simply quoting such involved passages as I dare not attempt to interpret, whenever the type has been unavailable. Cameron has disposed of a great number of so-called "types" to the British Museum authorities; but that these are in every case what they purport to be is open to doubt, since specimens bearing the same name and also labelled "type" in his handwriting are to be seen in the collections of the captors. In 1897 and 1899, when he began to describe Indian ICHNEUMONIDÆ, Cameron appears to have taken it for granted that nothing, or practically nothing, was known from the Oriental Region, beyond that which is contained in Smith's Catalogue of 1873 and Brullé's work; consequently one cannot be surprised at his describing as new in 1903, the *Sphex rugosus* of De Geer (1760), which is the *Pimpla bipartita* of Brullé (1846). With respect to relegating species to their correct genera Cameron was distinctly vague before the publication of Ashmead's tables in 1900; and even subsequently he cannot always be relied upon in this respect, since he seems blindly to have followed characters there set forth, with such results as the inclusion of male *Lissonota* (PIMPLINÆ) in the genus *Mesoleptus* (TRYPHONINÆ), &c. I consider few of Cameron's genera stable, and surmise that he erected them whenever at a loss in the recognised

* I have seen sixteen specimens labelled by Mr. Peter Cameron as the "types" of his species, of which I can discover no published descriptions, and as direct appeals to him for references, both on my own behalf and that of the British Museum, have elicited no reply whatever, I am led to consider them MS. names. Colour is lent to this view by the fact that the list was formerly longer and embraced those species brought forward by him in the Bombay Nat. Hist. Soc. Journal, late in 1909. These sixteen species are:—*Pimpla marei*, *Pimpla litigiosa*, *Pimpla asiatica*, *Ephialtes iridipennis*, *Tegona* (n. n.) *rufipes*, *Nothamia* (n. n.) *bicarinata*, *Anomalon leptogaster*, *Campoplex indicus*, *Campoplex zonatus*, *Campoplex binghami*, *Campoplex reticulatus*, *Limnerium longiventre*, *Limnerium annulipes* (nec Cress.), *Limnerium collinum*, *Limnerium clypealis*, and *Limnerium atratum*.

system; they are to be regretted, since so many are "noms de fantaisie, sans étymologie," censured by the British Association so long ago as 1842.

Probably the present family, in common with all parasitic Hymenoptera, has been collected less than any other group of insects, on account of the difficulty of the identification of its members. Professor Westwood's collection at Oxford contains many ancient specimens from Col. Sykes, Templeton, and Boys; but the majority are from the veteran Dr. G. H. K. Thwaites, F.R.S., F.L.S., Director of the Botanic Gardens at Peradeniya in Ceylon from 1849 to about 1880, who died at Kandy on 11th September, 1882. He also presented some two thousand insects to the British Museum, which has constantly received small parcels from India: thus, in 1843 a collection was received from Archdeacon Clerk, who took them about Moulmein; in 1845, from Ceylon (Rev. T. Wenham); in 1851, from Mr. Baly; in 1855, from North India (Capt. Reid); in 1869, from Bombay (R. R. Holmes); in 1879, from the East India Museum; in 1883, from Ceylon (P. N. Braine); in 1884, from the United Provinces (Mrs. Horne); in 1885, from Assam (Mrs. Evans); in 1887, from the Bombay Natural History Society (all captured about Poona by my friend Mr. R. C. Wroughton); in 1889, from Ceylon and from Quetta, through the Karachi Museum; in 1892, from Ceylon (Col. Yerbury); and many others. The Museum also possesses part of the specimens taken by the second Yarkand Mission and captured by Dr. Stoliczka, the majority being truly Indian; the remainder, which I have not seen, are in the Indian Museum.

Mr. Gardiner has published the results of his collecting in the Laccadive and Maldive Islands; and Col. Bingham, who died on 18th October, 1908, visited various remote and interesting collecting grounds, such as the Nicobar and Andaman Islands; he also collected in Burma in 1877, but most of his specimens are from the peculiar Sikkim district (*cf.* E. M. M. 1909, pp. 18 & 36). Leonardo Fea also collected largely in Burma some years ago, but the Parasitica amounted to little more than a hundred specimens, which are in the Genoa Civic Museum. Mr. George Lewis has collected Hymenoptera in Ceylon, whence Mr. E. E. Green, Mr. O. S. Wickwar, and Mr. T. B. Fletcher have recently sent me many specimens. Mr. G. C. Dudgeon found some interesting species in the Kangra Valley in the Punjab, as well as in Bhutan; and extensive collections from various districts are in the Pusa Collection and the Indian Museum. Col. Nurse's collection is mainly from Kashmir, Baluchistan, and the north-west Palæarctic districts, and is consequently of considerable interest as connecting the faunas of East and West; insects taken by Mr. Brunetti and others at Darjiling and Mussoori are very similar in their western affinities. All Mr. Rowland Turner's Assam ICHNEUMONIDÆ were taken in 1903–4 at an altitude of 6000 feet in the Khasi Hills, about Shillong, for the most part on the

blossoms of a meadow-sweet, allied to *Spiræa ulmaria*, but of a greener colour, and the smaller specimens were obtained by sweeping.

Metamorphoses.

The manner in which the eggs of Ichneumonidæ are laid has been known for considerably more than a century in a general way, but reliable accounts of individual oviposition are very rare; nor is it an easy matter to follow the development of these insects through all its stages. It may, however, be said that the eggs are deposited either upon or within the skin of Lepidopterous and other insects, as well as on spiders, false-scorpions, and centipedes, and that, if simply placed on the surface, they adhere by means of the viscous matter with which they are coated when first extruded from the spicula of the parent. They are elliptic or pyriform in shape, and usually ashy grey in colour, gradually assuming a darker tint on contact with the air. Those of certain genera of the Ophioninæ, such as *Ophion* and its immediate allies, are somewhat bean-shaped and are attached near one end by a long slender peduncle to the skin of the victim. The duration of this state has not been observed, but doubtless varies greatly under diverse atmospheric and other conditions. When the egg-shell splits, the enclosed larva does not at once emerge, but begins to imbibe the juices of its host through the fissure. The larva does not vacate its shell till after the first moult, its cast skin having been found by Brischke and some of the older authors attached to the egg. The internal feeder now penetrates the caterpillar's skin and takes up a position between the muscles contained in the splanchnic tissues and the alimentary canal, on the dorsal surface above the stomach, upon which it often rests, near the centre of the body, and nearly always with its head in the same direction as that of its host. Certain species of Tryphoninæ, including our *Monoblastus*, however, are larviparous, since they may often be seen carrying masses of what Gravenhorst thought were eggs, but which were proved by Haliday to be living and often cannibalistic larvæ, at their anal extremity. In the Pimplinæ and in *Paniscus* the larvæ are often external parasites, lying like a muffler round the prothorax of their hosts; while those of certain Cryptinæ feed exposed upon the eggs of spiders, etc., protected by nothing but the thread-sacs which enclose the latter.

As a rule, entomophagous larvæ are apodous, soft, whitish or yellowish, nearly cylindrical or ovate, somewhat pointed at each end, and always with a peculiarly broad lateral border of fleshy tubercles, bearing dark spiracles. In the earlier stages of growth, and in some cases throughout their larval state, they are curved. They consist of fourteen segments, of which the first or cephalic segment bears traces of antennæ on the frons, below which is a sometimes discrete clypeal area, anteriorly bordered and occasionally reflexed. On either side, below this border, are attached

the very short slender deflexed and corneous mandibles, of variable shape. Beneath these are concealed the labium and maxillæ, with the minute palpi of the latter. These organs are usually of dark coloration, but the whole of the body is pale, exhibiting but few distinctive features, excepting the dilated lateral border, which is discrete throughout its entire length from the main body.

Within the egg the larva is gradually developed from the ventral surface upwards. Dorsally, the cephalic segments first coalesce, then the anal and, lastly, the intervening space gradually becomes entire from behind forwards, the prothorax being finally completed. The alimentary canal is also formed from behind forwards. The digestive apparatus is a hollow cavity, or pear-shaped and elongated sac, with a very short intestine connecting anteriorly with the short and narrow œsophagus and with the oral organs, though at first closed behind. It is very similar in all Hymenopterous parasites, whether internal or external. Its endoderm becomes transformed into a glandular structure of two kinds, of which one elaborates the digestive juices, while the other diffuses the results in the form of nutriment throughout the body. In every case the intestinal portions continue small and rudimentary, passing no fæces, till the larva has attained maturity and ceased to feed. The colon and ileum are gradually evolved from without inwards from a column of cells, surrounded by muscular tissue, connecting the digestive cavity with the anus; their function being to transmit the fæces, they are not perfected till a late period of the larval existence.

The head and mandibles of the larva, as stated by George Newport in the case of *Trogus*, are corneous and yellow, with the margins and apices of the latter black. The mandibles are curved and apically acute, fitted for penetration and suction, but not for manducation. The maxillæ are three-jointed, with the apical joint broad, triangular, soft, and membranous, the second very short, and the basal joint both strong and elongate. The labium is triangular, with a slight central ridge. The antennæ are entirely rudimentary, but they are represented by small corneous callosities on the frons. The segments are all laterally explanate and project in the form of tubercles, which are especially prominent on the three thoracic segments and the basal ones of the abdomen. Their tubercular form is, however, most marked on the fifth and eleventh segments, which also bear distinct mammiform tubercles laterally upon the venter, acting as locomotive organs. In the later stages of growth these organs approximate more closely, and well illustrate the greater development of the dorsal than of the ventral surface. True legs are indicated only by six points upon the lower surface of the thoracic segments, in the same position relatively as the abdominal tubercles. The propedal process of the apical segment is acuminate and projecting, and is said by Berthoumieu to be reduced to normal form after the second or third moult. It is opposable to another beneath the thirteenth segment, and, with it, forms a prehensile organ, by

means of which the larva is enabled to affix itself and alter its position. The spiracles are oval and corneous, and situated on either side of the anterior part of each segment. The whole of the tracheal vessels are distinct and distended with air; and this fact abundantly disproves Boisduval's theory that internal larvæ do not directly breathe, but obtain sufficient oxygen from their food, which, he thought, was not taken through the mouth but assimilated by a kind of general absorption, in which case a sucking-mouth and respiratory organs would be superfluous. Professor Owen was of opinion that internal parasites undoubtedly destroy many of the minute tracheæ which ramify in the adipose tissue, and these would probably permit the escape of sufficient air for the respiration of the parasitic larvæ.

When full-fed, the larva emits rejectamenta to the extent of half its former size, and the abdominal segments become much shrivelled, though the thoracic are inflated and distended. About a month after evacuation the larva begins to assume the pupal state. The head is then swollen and retracted into the thoracic segments, and the rudiments of the eyes become darkened and convex; the larval skin first splits along the back of the head, and in half an hour the pupa has totally thrown it off. Many Ichneumonidous larvæ when full-fed leave their host's body and construct for themselves silken cocoons, numbers of which, and especially in the OPHIONINÆ, are very beautiful, being composed of iridescent stands or threads of mingled black and white, grey, and sometimes red or coppery hue. Others, like the ICHNEUMONINÆ, remain in the chrysalis of the demolished host, generally spinning for themselves, like *Pimpla instigator*, an internal silken lining upon it.

The pupæ of ICHNEUMONIDÆ exhibit, like those of beetles, all the members of the perfect insect inclosed in individual sheaths: the head is deflexed upon the prosternum, the antennæ lie along the outer edge of the sternum and extend to the centre of the abdomen or further, according to their length; the mandibles are closed and the palpi extended straight downwards until their apices nearly touch. The abdomen is fully developed, though the lateral tubercles are still very conspicuous, and the conformation of the basal segment, which is now pressed closely upon the metanotum, undergoes considerable modification during the pupal state. The genital organs are strongly protruded, at first rudimentary and surrounded by a dense liquid, but gradually becoming perfect as emergence approaches. The legs are pressed closely to the sides of the body; the femora drawn forward and the tibiæ folded back upon them; the tarsi lie along the outer side of the antennæ in a continuous line, the hind ones extending to near the abdominal apex.

As is the case with Hymenoptera in general, the length of the final quiescent condition of the larva is inversely proportionate to the brevity of its pupal existence, which often is no longer than of ten days' duration; but after the imago has thrown off the

pupal skin it remains, unlike the Lepidoptera, in the cocoon for a considerable period, during which it attains such perfection both in development and activity that, having gnawed its way to freedom by means of its mandibles, it is capable of flying away quite strongly from the mouth of the orifice, as I have myself observed.

Internal Structure.

The alimentary canal of the imago, as in the larva, is formed, says Newport in describing *Trogus*, of distinct layers or tissues: a muscular, a glandular, and a mucous; and is invested externally by a distinct transparent peritoneal membrane, processes or reflexions of which clothe every internal organ, the salivary and hepatic glands, the organs of circulation and reproduction, the adipose tissue and tracheæ. The short and narrow œsophagus becomes considerably elongated, and, instead of terminating as in the larva in the mesothoracic segment, is extended in the imago through the metathoracic into the abdominal segments. It is there dilated into a conical crop, which is separated from the true digestive cavity or stomach by a constriction at its apex and a reflexion inwards of its tissues to form the cardiac valve. This portion of the canal, the chylific ventricle, which occupies nearly the whole interior of the larva, is now restricted to the fifth, sixth, and seventh abdominal segments. It is a powerful muscular structure, somewhat elongate-oval in shape and is followed by the excretory or Malpighian organs, from twenty to thirty in number, where, by the internal reflexion of the tissues, is formed a second valve, the pylorus. The canal then becomes narrowed into what may be regarded as the duodenum and ileum, or small intestine. Beyond this it is again dilated into a more muscular structure, the colon or rectum, which terminates at the anal valve.

External Structure.

There are always present a distinctly separated head (bearing a pair of elongate antennæ), thorax and abdomen, three pairs of legs, and usually two pairs of membranous wings.

The *head*, viewed from above, is transverse or quadrate; from in front, it becomes more or less strongly narrowed towards the mouth and is always sculptured with punctures or reticulations. The eyes are very large and occupy nearly the whole anterior side of the head. The vertex bears three ocelli, situated triangularly, and behind them is the occiput sloping to the collar. Between the ocelli and the insertion of the antennæ is the frons, usually bearing glabrous scrobes upon its anterior portion; below these is the face, the central portion of which is known as the epistoma, its apical margin being usually separated from the clypeus, which extends across the whole front of the head, by a transverse im-

pression terminating on either side in a fovea. The apical margin of the clypeus is usually truncate, or sub-bisinuate, though occasionally dentately reflexed or simply rounded. The cheeks, which lie between the apical extremity of the eyes and the base of the mandibles, and the temples behind the eyes, are more or less broadly buccate, and the former vary in their length according as the eyes approach or recede from the mandibles, which are broader basally than apically, and sometimes basally as broad as the cheeks are long. The apex of the mandibles, which lie folded upon each other across the apex of the clypeus, is usually bidentate, the upper being in most cases much longer than the lower tooth, but in some instances the teeth are of equal length or the lower is wanting. Between the apex of the clypeus and the mandibles the labrum is more or less visible, being round and ciliated. The two pairs of palpi, the maxillary and the labial, are elongate; the former consists of five usually cylindrical, the latter of two triangular and two cylindrical, joints. The mentum, ligula, hypo-pharynx, etc., are not alluded to in descriptions.

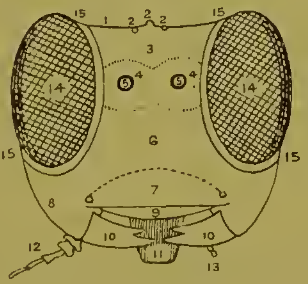

Fig. 1.—Head of an Ichneumon.

1, vertex; 2, ocelli; 3, frons; 4, antennal scrobes; 5, point of insertion of antennæ; 6, face; 7, clypeus; 8, cheeks; 9, labrum; 10, mandibles; 11, ligula; 12, maxillary palpus; 13, labial palpus; 14, eyes; 15, orbits.

The *antennæ* are inserted between the eyes in the front of the head. They are multi-articulate, as many as seventy joints being found in such genera as *Ophion*, while in others the number diminishes to fourteen, as in *Stilpnus*. The scape consists of the two basal joints (the radicula or minute basal not being counted). The first of these is oval or shortly cylindrical, with an incision on its outer side, in which is inserted the second joint or pedicellus, having its apex always free, but shorter than the basal joint. Next follows a minute joint, termed the annellus, which with the remainder of the antenna constitutes the flagellum. During life the antennæ are porrect and held while in repose straight forward, not recurved beside the body as in most orders of insects. After death they very often become convoluted and spirally coiled, as described by the older authors.

The *thorax* consists of three distinct sections:—That nearest the head is the prothorax, bearing the front pair of legs; the middle section is the mesothorax, bearing the intermediate pair of legs and the anterior pair of wings; the last section is the metathorax, bearing the hind pair of legs and the posterior pair of wings. The disc of these sections is known as the notum, their sides as the pleuræ, and the lower surface as the sternum. The prothorax is very short, usually transverse, extending laterally to the radices of the wings; its pleuræ bear grooves, in which the upper side of the front femora rests, and their margins are known as the epomiæ. The mesothorax is usually as broad as or a little broader than the head, and is divided into two distinct sections, termed the scutum or mesonotum, which is produced into the promiuent and often convex scutellum; two impressed lines are frequently found converging from the apex of the mesonotum to its disc,

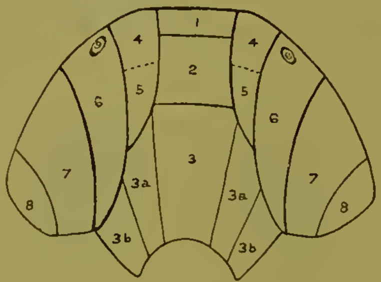

Fig. 2.—Metathorax of an Ichneumon.

1, basal area; 2, areola; 3, posterior or petiolar area; 3*a*, postero-intermedial areæ; 3*b*, postero-external areæ; 4, external areæ; 5, dentiparal areæ; 6, spiracular areæ; 7, lateral or pleural areæ; 8, juxta-coxal areæ; 9, spiracles.

near the scutellum, and are collectively known as the notauli. In contradistinction to these, the mesosternum is often similarly impressed ou either side at its junction with the mesopleuræ, and these impressions are termed the sternauli. The scutellum is much smaller than the disc of the mesonotum and is situated at the base of the mesothorax, between the hind pair of wings. It is more or less convex, nearly always triangular, with erect pilosity; and at its apex is a small prominence, designated the postscutellum. It will be noticed that the postscutellum forms the centre of a transverse, almost linear band, which laterally bears the hind wings. This is said to be the true metanotum, which is not referred to in descriptions. The convex area between it and the abdominal petiole is considered to be the true first abdominal segment, and is superincumbent upon the true metanotum, which is divided from it obliquely along the sides by a carina and extends back to and bears the hind coxæ. This portion is termed the propodeum or mediau segment by Bingham, Saunders,

and Cameron; but its old collective name of metathorax, embracing both the true metathorax and the superincumbent abdominal segment, is here retained, for the sake of convenience and in accordance with the usage of most authorities upon ICHNEUMONIDÆ. The scutellum is the centre of the insect, and consequently the prothorax is at the apex of the mesothorax and the abdomen at the apex of the metathorax. The metathorax is divided up in most instances by a number of costæ or carinæ, which are nearly always constant in the same species and form valuable characters for specific distinctions. The basal area occupies the extreme base of the metathorax, immediately beyond the postscutellum, and is often divided into three parts by longitudinal costæ, in which case the two lateral are termed the external areæ; beyond this may usually be seen a strong transverse basal carina and across the metathorax a little beyond its centre is more often a second apical transverse carina; between these two carinæ in the centre of the disc is a usually well-defined central area, known as the areola, divided from the areæ on either side by an often weaker longitudinal costa. The areæ on either side of the areola are known as the dentiparal, since their apices are not infrequently produced into stout and elongate apophyses or teeth; these areæ are sometimes centrally bisected by weak transverse costæ, known as the costulæ and usually situated in a line with the centre of the areola. Laterally, beyond the dentiparal, are the longitudinal spiracular areæ, bearing towards their base the metathoracic spiracles, which afford useful characters for main divisions on account of their constancy of shape. Laterally, beyond these again, are the lateral and finally the juxta-coxal areæ. Apically, beyond the apical transverse carina, the declivous part of the metathorax is termed as a whole the petiolar area, because from its apex is emitted the abdominal petiole; this apical region is sometimes longitudinally divided into five or three areæ by longitudinal costæ, in which case the petiolar area is said to be discrete. Of the above areæ, the areola is the most important and constant, at least some part of it being present when all other areæ have become obsolete or entirely wanting, through the razing of the costæ and carinæ. Its apical carina has been especially employed by Förster in grouping the *Pezomachi*; Thomson has used the basal and apical carinæ in his main divisions of the CRYPTINÆ, resulting in a beautifully natural classification, and the former carina is also a conspicuous feature of the PIMPLINÆ. Ashmead has founded genera upon the confluence of the juxta-coxal with the pleural areæ, and in most cases the apical central costæ are wanting, though these exhibit good specific features in the difficult groups of smaller Campoplegids.

The *abdomen* is connected with the thorax by a more or less distinctly constricted stem, called the petiole. This is the base of the first abdominal segment, which towards its apex becomes more or less explanate and is thence known as the postpetiole, usually

bearing distinctive sculpture. The second segment, near its base, often bears deep sulciform impressions at the sides, which are known as the gastrocœli, their apical margins being called the thyridii. There are eight dorsal segments of which the pygidium is rarely visible, being retracted beneath the seventh segment. There are also eight ventral segments in the male, but only six in the female; these are often longitudinally plicate, in the centre, after death and this is owing to the contraction of the supple tissues upon desiccation. The apical ventral segment is the hypopygium and is of variable form and extent, often covering the base of the terebra, which is composed of the central true ovipositor or spicula and its two lateral protecting valvulæ or sheaths. The length of the terebra varies in relation to the concealed or exposed mode of life of the host-larva, being in some cases twice as long as the insect itself, while in others it is barely visible beyond the apex of the hypopygium. In the genus *Rhyssa*, which oviposits in sawfly grubs deeply buried in the solid wood of trees, the terebra is strongly exserted, while in *Ichneumon*, which lays its eggs upon the skin of exposed caterpillars, it is very short.

The *legs*, so distinctive in many groups of insects, are here disappointingly uniform in structure, being nearly invariably long and slender, with few modifications, though in the Exochides they are short with the femora nearly globose. The basal joint or coxa, however, often bears a little tuft of dense pilosity in the Ichneumoninæ known as the scopula; it is sometimes dentate or cristulate beneath, as in *Phæogenes*, and is always more or less distinctly punctate. The next two joints compose the trochanter, the apical joint of which is designated, when necessary, the trochanterellus; and this is closely followed by the elongate and rarely dentate femur. The sometimes externally spinulose and centrally intumescent tibia is articulated to the end of the femur and at its apex gives rise to spines or calcaria, which are usually two in number, though sometimes there is only a single spine or even none. The tarsus is always five-jointed, its apical claws or onyches are sometimes internally pectinate or furnished with comb-like bristles; between the claws is the pad-like pulvillus; and the basal joint of the front tarsi is excised beneath, forming with the calcaria a beautiful apparatus for the cleansing of the mouth and antennæ. It should be borne in mind that the anterior legs are the two front pairs collectively; the posterior, the two hind pairs collectively; and that the front and hind legs each comprise but a single pair.

The *wings* vary greatly in extent, though little in outline or in the number of their nervures, and they do not extend beyond the anus; sometimes normally winged species are found with the wings rudimentary, and in the females of *Pezomachus* these organs are entirely wanting. The nervures, which are true veins in the wings of Ichneumonidæ, at first sight appear so uniform throughout the whole family that the older authors, with the exception of Wesmael, gained but few distinctive characters therefrom; and

when these were indicated original names were nearly always applied to them with the result that no fixed system came into vogue until Professor Thomson revised the whole subject and founded the first satisfactory nomenclature of nervures (*cf.* Morley, Trans. Ent. Soc. 1909, p. 439). I have described these nervures as follows :—The front margin of the wing is always bounded by a strong sustaining costa, which may or may not be united with the parallel and adjacent post-costa. The corneous stigma is a strong muscle to sustain the more slender veins and assist in folding the wing. From some part of it the radius or radial nervure runs in a curve to or near the apex of the wing. From the base of the wing, two other elongate nervures extend

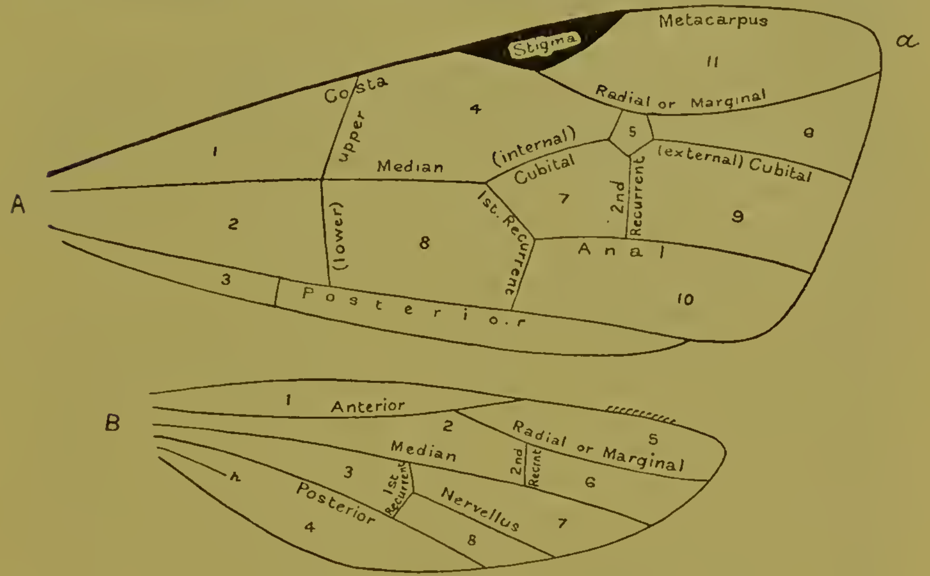

Fig. 3.—Wings of an Ichneumon.

A. Fore wing; *a*, apex; cells:—1, 2, 3, basal; 4, 5, 6, cubital; 7, 8, 9, discoidal; 10, anal; 11, apical or radial.
B. Hind wing; *h*, humeral nervure; cells:—1, costal; 2, 3, basal; 4, anal; 5, radial; 6, cubital; 7, 8, first and second discoidal.

to beyond its centre; of these the posticus or posterior nervure simply sustains the whole lower margin to the sinus at the anal angle, while the medius or median nervure is that in the centre and runs straight to the first recurrent vein; the portion of the nervure beyond this has usually been regarded as distinct, under the name of the discoidal vein, etc., but I find that in the very great majority of cases it is undoubtedly a continuation of the medius. Through the centre of the medius runs a transverse nervure, termed the basalis or basal nervure, which is not always continuous but sometimes coalescent for a greater or less distance with the medius. From the junction of the medius with the first recurrent vein a nervure runs (in Ichneumonidæ) upwards to the

apex of the wing below the radius, which is termed for brevity the cubitus or cubital nervure, though it is found by analogy with other Hymenopterous families that the cubitus does not extend beyond its incomplete apex in the centre of the first discoidal cell, known as the nervelet or ramellus. Two short nervures, the intercubiti or submarginal veins, connect the cubitus with the radius and these are always present in the ICHNEUMONES PENTAGONI, though the external is frequently wanting in the DELTOIDEI; these two nervures constitute the sides of the areolet, the apex of which is that part of the radial nervure between them, its base being formed by the two portions of the cubital nervure from between which is emitted the second recurrent nervure running straight down from the areolet to the anal nervure or nervus parallelus.

These nervures divide the wing into very distinct cells:—the three nearest the radix are the basal; the radial is above the radial nervure; below it are two or three cubital cells, of which the areolet is the central; below the cubital are the two discoidal cells, of which the inner only is referred to in descriptions; and below these again are the brachial cell on the inner side and the anal cell at the lower extremity of the wing.

The neuration of the lower wing is now much utilised for the grouping of both genera and species, and I have raised the whole disposition of our PIMPLIDES upon this foundation, with, I trust, remarkably natural results. Here we find a median nervure and a posterior nervure, connected by a first recurrent or nervellus, which emits from its outer side a distinct nervure to the margin of the wing. Further from its base the median is connected with the radius by a second recurrent nervure, the length of which compared with that of the radial (from their junction to the base of the radius) is employed for specific grouping. The nervellus or first recurrent nervure is said to be antefurcal if its upper extremity be nearer the radix than its lower, to be continuous or opposite if both extremities be equidistant therefrom, and to be postfurcal if the lower extremity be the nearer thereto; in the first of these cases the external nervure (when present) is emitted from below the centre of the nervellus, in the second from its centre, and in the last from above its centre, always at the point of angulation or geniculation. The cells of the hind wings furnish no features.

CLASSIFICATION.

In the first volume upon Hymenoptera of the present series, Col. Bingham divided them into two main divisions, those with the abdomen sessile, the Sessiliventres, and those with a more or less distinct petiole, the Petiolata; and the latter he subdivided into Parasitica and Aculeata. Prof. Förster in 1862 and 1868

proposed to divide the Hymenoptera into Ditrocha and Monotrocha, in accordance with the number of joints in their trochanter; but here difficulties arose, since no hard and fast line could be drawn, instances occurring in which a second joint was distinctly present though connate with, and apparently forming part of, the femur; and the ensuing divisions separated forms having obviously natural affinities and gave rise to the most incongruous grouping of species. Ashmead primarily divides the Hymenoptera into Phytophaga, in which the abdomen is sessile, with the trochanters two-jointed, and the larvæ possess legs; and Heterophaga, in which the abdomen is more or less petiolate, with the trochanters either one- or two-jointed, and the larvæ are apodous. The latter is further split up into the Aculeata, with the Oxyura or Proctotrypidæ, emitting the terebra from the apex of the abdomen; and the Ichneumonoidea, with the Cynipoidea and Chalcidoidea, emitting the terebra from the ventral surface of the abdomen. But further evidence is, I think, still needed before mingling the heterogeneous Proctotrypidæ with the Aculeata, though Konow has fully demonstrated the affinity of the Chrysididæ with the latter.

The above in reality differs but little from Westwood's classification, though it raises the Phytophaga to equality with the Entomophaga and Aculeata, which latter Bingham regarded as collectively constituting the Petiolata. But modern authors are becoming unanimous that there should be not a dichotomous but a three-fold classification, in which each section possesses some feature common to the remaining two; and the ancestral type of venation is somewhat hypothetical. The first of these sections is the Vespoidea, bearing one-jointed trochanters, petiolated abdomen, and in the ancestral type four cubital cells. The second is the Ichneumonoidea, bearing two-jointed trochanters, petiolated abdomen and but three (often supposititious) cubital cells. The third is the Tenthredinoidea, bearing two-jointed trochanters, sessile abdomen and four cubital cells. Thus we have the first and second sections constituting the Clistogaster; the third the Chalastogaster; the second and third the Ditrocha; the first the Monotrocha; the first and third the Tetrastega; and the second the Tristega. I am certainly of the opinion that the distinctions between the Phytophaga or sawflies, the Entomophaga or Ichneumons in general, and the Aculeata are too natural and nowadays well-known to need further elucidation. It is with the second division alone that we are concerned.

Sub-Order ENTOMOPHAGA or ICHNEUMONOIDEA.

The whole of this very extensive group is believed to be parasitic upon other insects, spiders, centipedes, etc., excepting only a part of the Cynipidæ. It consists of six sufficiently distinct families, which are thus recognised :—

(1) Evaniidæ alone have the abdomen rising from the dorsum of the metathorax.
(2) Cynipidæ alone have the terebra partly coiled and emitted from near the base of the abdomen.
(3) Proctotrypidæ alone have the terebra tubular and emitted from the apex of the abdomen.
(4) Chalcididæ alone are strongly punctate and brilliantly metallic in coloration.

(5) Braconidæ	alone have complete neuration	lack the second recurrent nervure.
(6) Ichneumonidæ		have the second recurrent nervure.

These last two families are undoubtedly the most highly specialised in the sub-order, both as regards their structure and probably also their instincts, though but little is known of the habits of the smaller of even the Palæarctic Ichneumonidæ. To the first four families the last bears no very close resemblance, and from them it will at once be distinguished with a little experience. But many genera of Ichneumons exhibit so close a resemblance to the Braconidæ that the division in general use, though very convenient, hardly appears natural; they are easily confused and the only sure method of discrimination is to bear in mind that the Ichneumonidæ have a transverse nervure across the front wing running down from the areolet to the anal nervure, all trace of which is lacking in the Braconidæ. In a few genera of the former, however, e. g., *Hemiteles*, *Orthocentrus*, and *Homocidus*, this second recurrent nervure, though always traceable, is often pellucid, though usually stronger at the anal extremity; and in those genera whose wings are rudimentary no reliance can be placed upon such nervures as may exist. In such cases as the latter, and also in the wingless forms, it is necessary to fall back upon the tegument of the abdomen, which is flexible beneath in Ichneumonids, e. g., *Pezomachus* and its brachypterous allies, but hard and chitinous, with the central segments connate and inflexible, in Braconids, e. g., *Chasmodon*, *Pambolus*, etc.

Hence we find that an Ichneumonid always has the abdomen rising from the apex of the metathorax; the terebra straight, not tubular, exserted from the ventral surface near the apex of the abdomen; the antennæ not geniculate; the colour not or but very rarely metallic, though often strongly shining; and the second recurrent nervure always present, or, in apterous and micropterous forms, the ventral segments not connate.

Table of Families of ICHNEUMONOIDEA.

1 (2)	Abdomen emitted from dorsum of metathorax.	**Evaniidæ.**
2 (1)	Abdomen emitted from apex of metathorax.	
3 (8)	Front wings with discoidal nervures; scape always short.	
4 (7)	Terebra emitted from near apex of the usually depressed abdomen.	
5 (6)	Second recurrent nervure present	**Ichneumonidæ.**
6 (5)	Second recurrent nervure entirely wanting ..	**Braconidæ.**
7 (4)	Terebra emitted from near base of the usually compressed abdomen	**Cynipidæ.**
8 (3)	Front wings with no discoidal nervures; scape often elongate.	
9 (10)	Prothorax not reaching base of wings; venter emitting terebra	**Chalcididæ.**
10 (9)	Prothorax reaching base of wings; anus emitting terebra	**Proctotrypidæ.**

Order HYMENOPTERA.

Family ICHNEUMONIDÆ.

About half the known Indian forms of this important family are dealt with in the following pages. These insects were well known superficially long before the time of Linnæus, on account of their wonderful habits and instincts; still even yet the family has received but little attention, because the extreme specific similarity, in conjunction with much individual variation, often renders the discrimination of the species a matter of considerable difficulty. Typical examples of the various subfamilies are most distinct and unmistakable, but the outlying genera such as *Megastylus*, *Atractodes*, and *Exetastes* are difficult to place correctly in natural sequence; and however distinct they may appear superficially, the most widely separated and incongruous of Ichneumonidæ will be found to differ comparatively little one from another in their structure.

De Geer was the first author to propose dividing the Terebrantia or Entomophaga into sections depending on the sessility or otherwise of the basal abdominal segment upon the metathorax, which method was elaborated by Schrank in 1802, and further supplemented with characters drawn from the neuration by Jurine in his 'Nouvelle Méthode de classer les Hyménoptères' of 1807. In 1818, Gravenhorst and Nees von Esenbeck drew up the first satisfactory system of natural sequence, which was followed by the former's 'Ichneumonologia Europæa.' This work deals exhaustively with the Ichneumonidæ as understood to-day, to the exclusion of all other Terebrant Hymenoptera, the characters utilised for their subdivision being: a compressed or depressed abdomen; a petiolate or subsessile abdomen; the shape of the head; presence or absence of the areolet; extent of exsertion of the terebra; shape and convexity of the scutellum; and many other pertinent points; upon these twelve genera and sixty subgenera are based. The principal of the former were *Ophion* and *Banchus*, which alone have the abdomen compressed; *Pimpla* and *Xorides*, with the abdomen subsessile and the terebra exserted; *Tryphon* and *Bassus*, with the abdomen sessile, but the terebra concealed; *Cryptus*, with petiolated abdomen and the terebra exserted; and lastly, *Ichneumon*, with petiolated abdomen and concealed terebra. These genera constitute the basis of modern classification; and although the sexes were at that time to a large extent considered distinct species—a common error, first indicated by Schrank, in 1781—it would be quite impossible to refer here to the subtle and gradual modifications which have since been found from time to time to be needful, or to mention the many hundreds of genera

into which the above sixty have more recently been subdivided upon the discovery of new forms, or points of divergence in the old ones which had been overlooked or considered insufficient for generic rank. The mere names of the known genera and species of ICHNEUMONIDÆ occupy over a thousand closely printed pages of Dalla Torre's Catalogue, and many have been added since the publication of that work in 1901.

It will be seen that the following subfamilies, into which the ICHNEUMONIDÆ are now primarily divided, differ only in elaboration and detail from the genera above quoted.

Table of Subfamilies of ICHNEUMONIDÆ.

1 (6) Areolet not pentagonal, often wanting; abdomen sometimes compressed....................	[ICHNEUMONES DELTOIDEI, Thoms.]
2 (5) Abdomen dorsally depressed, basally sessile or rarely subpetiolate.	
3 (4) Metanotum rarely longitudinally costate; terebra far exserted	PIMPLINÆ, p. 22.
4 (3) Metanotum usually longitudinally costate; terebra concealed	TRYPHONINÆ, p. 261.
5 (2) Abdomen laterally compressed, basally petiolate................	OPHIONINÆ, p. 343.
6 (1) Areolet pentagonal, never wanting; abdomen always depressed	[ICHNEUMONES PENTAGONI, Thoms.]
7 (8) Mesopleuræ sulcate below; terebra exserted	CRYPTINÆ.
8 (7) Mesopleuræ not sulcate; terebra concealed......................	ICHNEUMONINÆ.

It is probable that nowhere throughout the whole of the Animal Kingdom is generic and specific instability more strikingly illustrated than in the ICHNEUMONIDÆ, which have been so aptly termed the teeth and claws of Nature on account of their devastating properties; nor is this surprising. How marvellous a thing indeed is it that there should exist constancy of any kind in a group of insects whose larvæ are almost shapeless maggots, feeding wholly immersed within the bodies of other insects, one kind of parasite very often attacking several different species, which in certain cases belong to even distinct orders of insects. As though this were not sufficient cause for instability, we are told by Kriechbaumer (Ent. Nachr. 1889, p. 290) that even when surprised *in coitu* no criterion is thereby furnished that the sexes are those of the same species, since he maintains that cross-breeding is not uncommon in this family. To take a pair *in copula* is, however, an extremely rare occurrence, and I have succeeded in doing so only twice in the course of twelve years' experience, though in both cases the sexes were certainly conspecific. Consequently at the very outset caution is necessary, in that each of the subfamilies enumerated above contains so great a variety of forms as to render concise tabulation very

difficult. Thus in the ICHNEUMONINÆ instances occur in which the outer nervure of the areolet is at least pellucid; or again, the wings may be so abbreviated as to possess no trace of an areolet; the abdomen is occasionally compressed, and its basal segment may be as little sculptured as in the CRYPTINÆ; and lastly, the terebra may be very distinctly exserted. In all these exceptions, however, it will be found that the mesopleuræ are not separated from the mesoternum, as is invariably the case in all the CRYPTINÆ. In these the terebra is rarely not at all exserted, the areolet is in some instances quite square or with its outer nervure so completely wanting that only the petiolate abdomen prevents such species from being included in the TRYPHONINÆ. No reliable character has yet been enunciated by which to discriminate between the males of the PIMPLINÆ and TRYPHONINÆ, though the exserted terebra will at once distinguish females of the former; in the tribes XORIDIDES and PIMPLIDES the males are at once known by the very distinctly tuberculate abdomen, but in the LISSONOTIDES, etc., the surface is smooth. The OPHIONINÆ even, which differ from all other subfamiles in their compressed abdomen, may become accidentally deplanate from artificial causes. The following diagnoses may assist in the elaboration of the above table.

Subfamily PIMPLINÆ.

Head transverse, more rarely tumidulous, buccate or subglobose; eyes often emarginate next the scrobes; clypeus usually convex and excavate before its apex; mandibles a little narrowed apically, teeth subequal. Antennæ filiform or setaceous, very rarely centrally excised. Thorax stout, often deplanate discally; pronotum sometimes elongate; mesonotum rarely transversely striate, notauli deep and elongate; metathorax rarely with distinct or entire areæ, transverse costæ usually alone distinct; spiracles oblong or circular. Abdomen elongate, depressed or slightly convex, often rugulose, tuberculate or with impressed lines, sessile; first segment either convex, short and tumidulous or long and subpetiolate basally, its spiracles before the centre; terebra always exserted, sometimes more than twice the length of the body. Legs normal or somewhat short; claws frequently pectinate and in the females not rarely basally lobate. Wings with areolet wanting or broadly triangular, very rarely subpentagonal.

Subfamily TRYPHONINÆ.

Head transverse, tumidulous or subglobose; eyes entire, very rarely emarginate next the scrobes; face sometimes strongly protuberant; clypeus generally discrete; mandibles a little narrowed apically, the teeth not always of equal length. Antennæ filiform

or setaceous, very rarely incrassate in the centre or at the apices. Thorax stout; metathorax distinctly or obsoletely areated, longitudinal costæ usually present; spiracles circular, more rarely ovate. Abdomen of various outline, depressed or in the females apically subcompressed; basal segment sessile or subsessile, nearly straight and rarely subarcuate; its spiracles before, more rarely in or slightly behind, the centre; terebra always very short, more rarely concealed and at most but subexserted. Legs usually somewhat elongate, but in one tribe strongly incrassate; tibial calcaria sometimes wanting; claws not unusually strongly pectinate. Wings normal or ample; areolet wanting, triangular or rhomboidal, never pentagonal.

Subfamily Ophioninæ.

Head transverse or buccate; eyes oblong, often emarginate next the scrobes; face nearly always with sericeous pilosity and often prominent; clypeus usually indistinctly discrete; mandibles narrowed apically, with the teeth subequal. Antennæ filiform or setaceous, usually strongly elongate. Thorax stout, more rarely subcompressed, very finely punctate and occasionally glabrous, rarely rugose; metathorax often longitudinally impressed, the areæ wanting or inconspicuous, areola often semicircular; spiracles circular or oblong. Abdomen strongly compressed throughout, or towards the anus only; petiolate, elongate and often linear; terebra sometimes short, often half but not often fully the length of the body; basal segment narrow and sublinear, rarely abruptly dilated at the apex, its spiracles in or beyond, rarely before, the centre. Legs normal or elongate, hind femora rarely incrassate and dentate, their tarsi sometimes spatuliform and claws rarely pectinate. Wings normal, often narrow; areolet triangular, rhomboidal, often petiolate or wanting, never pentagonal; stigma sometimes very large and semicircular; radial cell sometimes broadly trapeziform.

Subfamily Cryptinæ.

Head generally transverse or tumidulous, more rarely subglobose; eyes oblong or round, entire or nearly so; clypeus often discrete; mandibles more rarely narrowed apically, bidentate, with the teeth usually of equal length. Antennæ setaceous, often very slender or incrassate throughout, sometimes pauci-articulate. Thorax stout, finely punctate; mesonotal notauli distinct; metathorax usually completely areated, though sometimes with transverse carinæ only; apophyses often prominent; spiracles subcircular, more rarely ovate; mesosternum always with distinct lateral sulci. Abdomen distinctly petiolate, very rarely subsessile or subcompressed; basal segment arcuate, longer than the width of

the usually smooth and glabrous postpetiole, its spiracles in or beyond the centre and nearer to each other than to the apex of the segment; gastrocœli wanting or subobsolete; terebra nearly always elongately exserted. Legs slender, front tibiæ occasionally swollen. Wings rather ample, not rarely rudimentary or wanting; areolet pentagonal, often large and rarely with outer nervure wanting.

Subfamily ICHNEUMONINÆ.

Head generally transverse or tumidulous, more rarely subglobose; eyes oblong and entire; clypeus imperfectly discrete; mandibles apically narrowed, teeth usually very unequal in length. Antennæ filiform or setaceous, rarely subserrated, stouter in female than in male. Thorax stout, longer than high, finely punctate; metathorax profusely areated, sometimes with stout apophyses; juxtacoxal areæ usually entire; spiracles linear, subovate or circular; mesosternum not laterally sulcate. Abdomen depressed, oblong-fusiform and petiolate; basal segment obtusely geniculate towards its apical third, its spiracles nearly always distinctly behind the centre and further from each other than from the apex of the segment; postpetiole often transverse, with very distinct sculpture; gastrocoeli nearly always very distinct; terebra stout, concealed or but slightly exserted. Legs normal or subincrassate; front coxæ transverse, hind ones not conical. Wings normal with the areolet pentagonal, very rarely deltoid or rhomboidal.

Subfamily PIMPLINÆ.

Unlike the Aculeata, the ICHEUMONIDÆ have been so utterly neglected that practically nothing was known of the Indian PIMPLINÆ until 1897, in spite of Smith's 'Catalogue of Indian Hymenoptera' of 1873. At the beginning of 1899 only eleven species of PIMPLINÆ were definitely known to inhabit the Indian Empire; the only publications relative to these insects up to that time being a single species each of *Xylonomus* and *Coleocentrus* described by Bingham, a *Polysphincta* brought forward by Ashmead, a *Pimpla* unrecognisably diagnosed by Walker in 1860, four species of the same genus enumerated by Cameron, some notes on *Xanthopimpla* by Van Vollenhoven in 1879, a couple of indistinguishable insects, probably referable to the OPHIONINÆ, mentioned from Ceylon by Motschulsky in 1863, and a few ancient species, such as *Sphex rugosus*, de G., *Ichneumon punctator*, L., and one or two species described by Brullé in his general account of Hymenoptera, all of which latter were vaguely said to have come from "India" or "the Indies."

When Dalla Torre published the first part of his 'Catalogus Hymenopterorum—Ichneumonidæ,' however, in 1901, a great stride had already been taken, and we there find the Indian total standing at 71 species, due to contributions by Dr. R. Krieger and Peter Cameron, though this total must be reduced when it is remembered that *Pimpla curvimaculata* = *Xanthopimpla tigris*, *Pimpla punctator* is unrecognisable, *Theronia areolata*=*T. clathrata*, and *Rhyssa bipartita*=*Hemipimpla rugosa*, etc. Cameron has since that time described some fifty new species, and I have been enabled, in the following pages, to bring forward over fifty more; with the result that even now no more than 183 different PIMPLINÆ are known throughout India.

In his first paper dealing with Indian PIMPLINÆ (Manch. Mem. 1897), Cameron says but a very few words respecting the distribution of Hymenoptera in general, to the effect that they are "but feebly represented, in fact they are almost absent in the southern parts of the Indian Peninsula." Up to the time of the publication of his paper upon fifteen species taken there by Col. Nurse in 1907, Cameron could compile a list of but four different kinds of ICHNEUMONIDÆ known to inhabit the Presidency of Bombay, and even these had been described during the present century. But they appear to be more numerous in Ceylon, as shown by his paper on the species collected there by Mr. E. Ernest Green in 1905, and are probably not uncommon in the Himalayas, whence the very great majority of the Pimplid records have originated.

The PIMPLINÆ as a whole may be recognised by the tuberculate or obliquely incised abdomen, though these characters fail in several groups to such an extent that even Gravenhorst described several of the males under the subfamily TRYPHONINÆ, and no good definition has yet been published by which to distinguish the males of the TRYPHONINÆ from those of the more smooth-bodied tribes of the present subfamily. The females are readily known by the sessile abdomen and exserted terebra; the sole exception occurring in the genus *Banchus*, which cannot, however, be separated in general structure far from *Exetastes*, in which the terebra is very distinctly exserted; hence the BANCHIDES lead up naturally to the TRYPHONINÆ and, indeed, were placed therein by Thomson. That the LISSONOTIDES have any close relationship with the typical PIMPLIDES I do not for a moment believe; the ACÆNITIDES, as at present grouped throughout the world, are very heterogeneous; and the BANCHIDES are admittedly aberrant wherever placed; while the XORIDIDES, though related to some extent in their thoracic sculpture with *Rhyssa*, appear worthy of ranking as a distinct subfamily.

Of the following tribes, the PIMPLIDES may be known at once from the LISSONOTIDES, with which alone they can be confused, by their stouter and more robust conformation, with the abdomen and thorax less cylindrical and the conspicuous rugosities or

tubercles of the former replaced by more or less even and distinct punctation. The ACÆNITIDES, though well distinguished by the characters indicated, do not appear to be by any means a natural group but to contain very incongruous species; and, provided that the HEMIGASTRIDES were correctly understood by Cameron (of which neither he nor I am satisfied), these two tribes might with advantage be united. The BANCHIDES have at different periods been placed in the OPHIONINÆ, TRYPHONINÆ and the present subfamily, where they appear to me less out of place than elsewhere, though at once known from the remainder of the ICHNEUMONIDÆ by the peculiarly arcuate, sessile body and the large, rhomboidal alar areolet.

Table of Tribes of PIMPLINÆ.

1	(10)	Areolet not large and rhomboidal; terebra usually elongate.	
2	(5)	Hypopygium reaching the compressed anus and covering base of terebra.	
3	(4)	Basal segment petiolate, with spiracles beyond its centre	*Hemigastrides*, [p. 24.
4	(3)	Basl segment subsessile with spiracles at or before centre	*Acænitides*, p. 39.
5	(2)	Hypopygium reaching neither the depressed anus nor base of terebra.	
6	(7)	Head cubical and not constricted posteriorly; mandibles prominent	*Xoridides*, p. 57.
7	(6)	Head transverse; usually constricted posteriorly; mandibles normal.	
8	(9)	Abdomen distinctly impressed or tuberculate, strongly punctate	*Pimplides*, p. 83.
9	(8)	Abdomen not impressed nor tuberculate, usually finely punctate	*Lissonotides*, [p. 215.
10	(1)	Areolet very large and rhomboidal; terebra hardly exserted	*Banchides*, p.242.

Tribe *HEMIGASTRIDES*.

A small group composed of the two genera, *Hemigaster* and *Macrogaster*, was erected by Ashmead in 1900 for species which he considered most closely allied to the CRYPTINI and the MESOSTENINI, among the CRYPTINÆ, from any of which it very materially differs, however, in the entire absence of the alar areolet and in the shape of the stigma, which is narrow and lanceolate. In these two genera, he says, the marginal cell is subelongate and extends nearly to the apex of the wing, and the single submarginal nervure is short but distinct, and is emitted from the cubital nervure before the second recurrent nervure.

Subsequently Cameron published his genus *Arthula*, which he considered most closely related to the TRYPHONINÆ, and at the same time gave the following table of genera, though in 1899

he had considered *Macrogaster* to belong to the PIMPLINÆ and *Hemigaster* as intermediate between the CRYPTINÆ and ICHNEUMONINÆ, in which latter he had then unhesitatingly placed *Chreusa*, proposing for it and *Rothneyia* a new group, termed by him ROTHNEYINÆ. Subsequent systematists have allowed *Chreusa* to remain in the JOPPIDES and placed the remaining genera, as a group apart, in the CRYPTINÆ. *Arthula*, however, has the abdomen subimpressed, as in the PIMPLINÆ; *Macrogaster* has the petiolar spiracles before the centre of the segment and is compared by Cameron throughout with *Pimpla* (*cf.*, however, Ann. Nat. Hist. xx. 1907, p. 17); and the neuration is identical in *Hemigaster*, whose facies in other respects is certainly strongly Cryptid. I consider them very naturally placed as a Cryptoid group of the PIMPLINÆ, immediately preceding the equally puzzling XORIDIDES. None of the Oriental species appears to have been yet bred.

Table of Genera.

1 (4) Central mesonotal lobe triangular, apically truncate; front claws bifid.	
2 (3) Metanotal areæ not entirely wanting; petiolar spiracles beyond centre	MACROGASTER, Brul., p. 25.
3 (2) Metanotal areæ wanting; petiolar spiracles central	CHREUSA, Cam., p. 31.
4 (1) Central mesonotal lobe not triangular, apically rounded; front claws simple.	
5 (6) Metanotum with areæ; postpetiole dilated; metatarsi not longer than the following joints	HEMIGASTER, Brul., p. 34.
6 (5) Metanotum with no areæ; postpetiole not dilated; metatarsi longer than the following joints.	ARTHULA, Cam., p. 37.

Genus **MACROGASTER**,* *Brul.*

Macrogaster, Brullé, Hist. Nat. Ins. Hym. iv, 1846, p. 184.
Ctenotoma, Cameron, Ann. Nat., Hist. xx, 1907, p. 17.

GENOTYPE, *M. rufipennis*, Brullé.

Head large and not much dilated behind the large eyes, cheeks

* The generic name, *Macrogaster*, was applied to Coleoptera in 1805 by Thunberg, and to Arachnida in 1843 by Miesch. It is consequently probable that the Hymenopterous genus will have ere long to be renamed; but I am not aware that either of the earlier genera are in use by systematists and prefer to retain names until their alteration becomes of some use, which does not appear to be the case here. Brullé's title is retained by Dalla Torre in 1901 and Ashmead in 1900. *Macrogaster* was also applied to a genus of Zeuzerid moths by Duponchel (*cf.* Doubleday's List and Newman's British Moths, p. 17, etc.).

distinct, face centrally carinate; clypeus rounded or with the sides slightly oblique at the apex, basally indistinctly discrete; lower mandibular tooth large, the upper smaller. Antennæ stout and never as slender as those of *Rhyssa* or *Pimpla*. Thorax stout; mesonotum not transversely striate; notauli distinctly impressed, their middle lobe small and triangular, basally transverse, strongly punctate and often elevated; metanotum with more or less distinct, though never complete, areæ and large linear spiracles. Scutellum hardly elevated, laterally immarginate and basally impressed; postscutellum basally bifoveolate. Abdomen stout, glabrous and nitidulous, neither punctate nor strigose, and with no impressions; basal segment less stout than in *Pimpla*, not discally bicarinate and of variable form, with the spiracles a little beyond the centre; hypopygium large and cultriform; terebra elongate, at least as long as the abdomen. Legs stout, as in *Pimpla*, with short calcaria; claws elongate, curved and simple. Wings with no areolet; second transverse recurrent nervure emitted from close to the submarginal, much closer than in *Pimpla*; stigma narrow and lanceolate; radial cell elongate and extending nearly to the apex; first recurrent of hind wings straight and not intercepted.

Range. Assam, Singapore and South Africa.

Cameron says (Manch. Mem. 1899, p. 193) of the Indian representatives of this somewhat anomalous genus: "I believe I have correctly referred the following species to Brullé's genus. . . . His generic description, however, is very defective in some important points; and it is quite possible that our species may not belong really to *Macrogaster*. He places *Macrogaster* next to *Cryptus*, but the relationship of our species is undoubtedly with the Pimplides. In neuration it agrees with *Epirhyssa*, to [*sic*] which the species described by Smith (Proc. Linn. Soc., Zool. 1857, p. 121)* is clearly congeneric; but it differs in the mesonotum not being striated, and in other respects." Later (Ann. Nat. Hist. xx. 1907, p. 16) he expressly states that "*Macrogaster*, Brullé, does not belong to the Pimplinæ"; but there can, I consider, be but little doubt that it is correctly placed here, since it is certainly allied to the Acænitides in the conformation of the abdomen and subincrassate hind femora.

* Brullé's inadequate description has certainly been responsible for considerable confusion; thus Smith (*loc. cit.*) in describing this presumptive *Epirhyssa* under the genus *Macrogaster* says that "this species may possibly be a *Rhyssa* with the petiolated submarginal cell obsolete; the neuration of the wing agrees with that of Brullé's genus *Macrogaster*. I am not acquainted with any other genus to which it could belong; the antennæ are those of *Rhyssa*, not apparently of *Macrogaster*."

Table of Species.

1 (6) Central mesonotal lobe higher than the lateral; metanotum more or less transversely strigose or reticulate.	
2 (5) Body black.	
3 (4) Legs nearly entirely black; antennæ not white-banded.	*nigricans*, Cam., p. 27.
4 (3) Legs mainly pale; antennæ white-banded	*varipes*, Cam., p. 28.
5 (2) Abdomen and anterior legs red, hind legs black	*ferrugineus*, Cam., p. 29.
6 (1) Central mesonotal lobe not higher than the lateral; metanotum not reticulate or transversely strigose	*luteus*, Cam., p. 30.

1. **Macrogaster nigricans**, *Cam.*

Macrogaster nigricans, Cameron,* Manch. Mem. 1899, p. 194 (♀).

♀. *Head* black, with the facial orbits broadly, and the frontal narrowly, testaceous-flavous; face strongly punctate, becoming irregularly reticulate; epistoma prominent and in ♂ carinate above; clypeus impunctate, with the sides straight and oblique; mandibles with elongate white pilosity, their basal half deeply punctate and centre bicarinate; palpi infuscate. *Antennæ* shortly pubescent throughout. *Thorax* immaculate; mesonotum strongly and deeply punctate, its apex transverse, with the central lobe distinctly elevated; metanotum apically deplanate, transversely striolate, laterally at the base and before the spiracles irregularly reticulate, with a small, transverse and apically emarginate basal area; pro- and meso-pleuræ punctate-strigose, with the latter centrally glabrous and plumbeous; metapleuræ reticulate and white-pilose. *Scutellum* nitidulous and apically plumbeous, with large and sparse punctures; basal fovea large, deeply impressed and as broad as the scutellum, transversely tricarinate with the

Fig. 4.—*Macrogaster nigricans*, Cam.

* An asterisk against the name of a species in the synonymy indicates that a type or cotype has been examined by the author.

central carinæ straight and the lateral more slender and sub-oblique; postscutellum large and deplanate with a small central fovea at its base and a large, deeply impressed one on either side extending to its apex. *Abdomen* glabrous and nitidulous, black, with a distinct plumbeous reflection; basal segments nude, the apical with white pilosity; ventral segments plumbeous, with their apices white; hypopygium punctate and cultriform; terebra almost as long as body (12 millim.). *Legs* densely white-pilose, black, with the front femora and tibiæ anteriorly dull testaceous; coxæ and femora somewhat strongly punctate. *Wings* infuscate hyaline, and subinfumate below the stigma and at the apex.

Length 13 millim.

The ♂ differs little from Cameron's description of the ♀, given above. It has the flagellar joints apically nodulose; the vertex broad, as broad as the thorax; the eyes are prominent and render the head broader than the thorax; the palpi fulvous; the scutellum is punctate throughout with its basal fovea strigose; the metanotum is fully areated with only the glabrous areola confluent with the petiolar area, the costulæ are emitted but shortly beyond the transverse basal area and the large spiracles lie in a glabrous space; the basal segments are laterally pilose with the spiracles of the first slightly before its centre; the genital organs are large, red and exserted; the wings have the whole of their apices and a semifascia below and beyond the stigma somewhat strongly piceous.

Length 11 millim.

ASSAM: Khasi Hills (*Rothney*, Brit. Mus.; *B. Warren*, 18. v. 09, Ind. Mus). MALAY STATES: Penang (*H. N. Ridley*, Brit. Mus.).

Type in the British Museum.

The ♀ was described from Rothney's collection and captured in the Khasi Hills of Assam; I have seen the type in the British Museum and am sure it is congeneric with the same author's *Siphimedia iridicolor*, of which the type is also in the same Museum, from Borneo; the only distinctions I can trace between these two specimens are the broader head of the latter, in which also the second recurrent nervure of the fore wings is received beyond, and not at (as in *M. nigricans*), the submarginal nervure.

The ♂ is here described for the first time from an example from Penang.

2. Macrogaster varipes, *Cam.*

Macrogaster varipes, Cameron,* Manch. Mem. 1899, p. 196 (♀).

A black species with the head and all the abdominal segments white-marked, and the flagellum with a broad band of the same colour. *Head* black; the strongly punctate and sparsely white-pilose face and clypeus, and the frontal orbits (the outer narrowly above and broadly below) stramineous, with a slender black line

down the epistoma, dilating quadrately above the clypeus; mandibles black, with long white pilosity, their base coarsely and irregularly punctate; palpi stramineous. *Antennæ* black and pale-pilose, with a broad band on the twelfth and following joints, as well as the scape and basal flagellar joint beneath, white. *Thorax* black; mesonotum somewhat strongly punctate and discally bi-carinate from the notauli to the scutellar impression; notauli deeply impressed, with their central lobe elevated and not strongly constricted basally, the lateral centrally subglabrous; pro- and meso-pleuræ punctate-aciculate, with the latter centrally smooth and plumbeous: metanotum basally smooth, with its central area quadrate, petiolar area laterally trans-striate, before the spiracles irregularly strigose and obliquely carinate; metapleuræ closely and coarsely punctate, subreticulate below and at the apex. *Scutellum* strongly punctate; postscutellum deeply impressed basally, apically white and glabrous. *Abdomen* black, with a plumbeous reflection and all the segments apically stramineous; the first somewhat elongate, with its basal half distinctly constricted, and the apical pale band broad; venter stramineous, with the basal segment black and bearing a basal acuminate tooth; hypopygium flavescent and narrowly black centrally; terebra slightly longer than the body (13 millim.). *Legs*: anterior pairs flavous, with their femora fulvescent; hind legs fulvous, with the coxæ, apices of trochanters, femora narrowly at base and broadly at apex, and apices of their tibiæ, black; hind coxæ apically white-marked. *Wings* subhyaline, with a short fascia below the stigma and the apices infumate.

Length 12 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

3. **Macrogaster ferrugineus**, *Cam.*

Macrogaster ferrugineus, Cameron,* Manch. Mem. 1899, p. 198 (♂).

A black species, with the head flavous and the abdomen red. *Head* flavous, with only the aciculate and centrally carinate frons (broadly in the centre), the largely punctate vertex and the occiput above, black; frontal orbits elevated and sulcately bordered above; face strongly punctate, with dense, infuscate pilosity and its apex stoutly carinate centrally; clypeus centrally broadly impressed and apically glabrous; mandibles smooth and flavous, with their apices black; palpi stramineous, with elongate white pilosity. *Antennæ* black, shortly pubescent throughout and nearly as long as the body, with the scape clear red and the base of the flagellum rufescent. *Thorax* black; propleuræ punctate above, centrally strigose and smooth below; mesonotum closely punctate, with the lateral lobes centrally sulcate, and with four stout carinæ at the base of the central lobe; mesopleuræ smooth above, and obsoletely punctate and white-pilose below, with the

callosities large; metanotum with three basal areæ, of which the areola is much the smallest and the outer ones punctate, its disc broadly glabrous, the sides irregularly strigose and the apex triangularly carinate on either side; metapleuræ closely punctate, basally more closely and obliquely carinate. *Scutellum* punctate throughout, but less strongly than the mesonotum, its apex and that of the smooth postscutellum subflavidous; latter closely striate at the base on either side and distinctly carinate apically. *Abdomen* red and glabrous, with the anus subnigrescent. *Legs* testaceous, with the hind ones deep black throughout, with black pilosity; hind calcaria testaceous. *Wings* hyaline and infumate only at their apices; nervures and stigma black; second recurrent nervure with very broad, but not confluent, fenestræ.

Length 9 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

There is a badly broken specimen in the Calcutta Museum, which possibly belongs here; it was taken by W. Doherty in Tenasserim.

4. **Macrogaster luteus**, *Cam.*

Macrogaster luteus, Cameron,* Manch. Mem. 1899, p. 199 (♂).

A luteous species, with black markings, antennæ and stigma. *Head* pale; face strongly punctate and densely infuscate-pilose, with the epistoma broadly carinate basally; clypeus semicircular and laterally foveate above, sparsely punctate and apically rounded on either side; inner orbits distinctly margined above and vertically sulcate; frons centrally impressed, laterally closely punctate, with an obtuse carina between the scrobes; vertex sparsely punctate, black, with the occiput concolorous above. *Antennæ* black, becoming piceous apically; the pilose scape clear and the pubescent flagellum dull, flavescent beneath. *Thorax* luteous; pro- and meso-pleuræ strongly punctate, the former strigose below and the latter black-marked; mesonotum strongly punctate, with the central lobe basally trilobate and apically black; the lateral lobes basally confluent and mainly black; metanotum basally black, with three apically punctate areæ, of which the areola is broader than long, apically rounded, emitting the costulæ from its sides, and from its centre a shorter and straight carina; petiolar area glabrous and laterally carinate, with a small area at its base; metapleuræ and sternum closely punctate and, between the carinæ, stoutly and irregularly strigose. *Scutellum* convexly declivous at base and apex, strongly punctate, with elongate infuscate pilosity, and its apex black; postscutellum impunctate, nitidulous and subglabrous. *Abdomen* nitidulous and impunctate; luteous, with all the segments, except the first, basally black and with the markings constricted towards the anus; gastrocœli broad, smooth and oblique. *Legs* concolorous with the body; luteous, with the

hind coxæ externally above, their trochanters apically, and their tarsi, black; tibiæ and tarsi shortly fulvous-pilose; hind femora strongly and closely punctate. *Wings* hyaline, with their apices subinfumate; fenestræ of second recurrent nervure distinct; the upper basal intercepts the median nervure beyond the lower basal; nervures and stigma black.

Length 8–9 millim.

ASSAM: Khasi Hills.

Type in the British Museum.

The extent of the black marking on the legs is variable, and the hind femora are sometimes broadly black beneath.

If this species is to be regarded as at all typical of the HEMIGASTRIDES, I have no hesitation in saying that that group should be included in the ACÆNITIDES, since the type of *M. luteus*, which was acquired by the British Museum in 1899, quite certainly differs only specifically from my *Acænitus xanthorius*; but since Cameron himself, as stated above, was doubtful of the propriety of including his Oriental species in this genus, it is impossible to fix Brullé's genus without closer acquaintance with the typical species (*M. rufipennis*, Brul., Hist. Nat. Ins. Hym. iv, p. 185, tab. xli, fig. 4, ♀) than I have had an opportunity of obtaining. It is significant, perhaps, of an ignorance of that genus that Brullé describes no species of *Acænitus*.

Genus CHREUSA, *Cam.*

Chreusa, Cameron, Manch. Mem. 1899, p. 209.

GENOTYPE, *C. fulvipes*, Cam.

Wings with no areolet; scutellum large, pyramidal and laterally broadly carinate; metanotum with only the basal or central area defined and laterally mucronate with large apophyses or a plate. Eyes large and cheeks elongate; vertical orbits hardly developed, the internal distinctly margined next the scrobes. Antennæ incrassate, compressed towards the apex. Clypeus not discrete, basally foveate on either side and apically rounded; mandibles triangular, with usually but a single apical tooth. Thorax large, with indistinct notauli; mesopleuræ longitudinally sulcate below. Basal abdominal segment large, with the postpetiole dilated and the second with no gastrocœli; hypopygium very large, emitting the terebra from its base. First joint of the front tarsi basally strongly curved, subexcised, with the elongate tibial calcar sinuate.

Range. Assam.

The form of the abdomen, with but three visible segments, resembles that of *Rothneyia*; and, indeed, Cameron at first proposed to place it and the present genus in a new group of the ICHNEUMONINÆ, under the name ROTHNEYINÆ, but this has not been accepted by systematists, since he himself placed the present

genus in the group of *Macrogaster* in 1899; and, in any case, the distinct sternauli and exserted terebra exclude it from the ICHNEUMONINÆ. Originally Cameron considered the present genus to belong to the section of ICHNEUMONINÆ with the metathoracic spiracles linear and those of the petiole between the centre and apex, though differing from all known groups in the inflated three basal segments, the elevated apex of the third and invisibly telescoped remainder.

That the two species placed in this genus by Cameron are really homogeneous I consider open to doubt: the absence in the first and typical species of a basal scutellar fovea and the obtusely bidentate mandibles of the second, are points of considerable structural dissimilarity. I have seen this genus in the British Museum; it bears a strong superficial resemblance to *Hemigaster*. Females alone are at present known.

Table of Species.

1 (2) Black, with flavous markings, the coxæ and base of antennæ black .... *fulvipes*, Cam.
2 (1) Red, with the coxæ and base of antennæ concolorous.............................. *lutea*, Cam.

5. **Chreusa fulvipes**, *Cam.*

Chreusa fulvipes, Cameron,* Manch. Mem. 1899, p. 210 (♀).

A very profusely flavous-marked species, with red legs. *Head* slightly broader than the thorax and narrow behind the eyes; black, with the epistoma, clypeus, palpi, inner orbits throughout but broader apically, stramineous; face and the centrally black-marked clypeus strongly punctate and sparsely white-pilose; vertex strongly punctate and frons deeply excavate. *Antennæ* as long as the body, black, with the apices dilated and piceous; joints eight to sixteen, and underside of scape, pale stramineous. *Thorax* closely and strongly punctate and white-pilose; notauli and scutellar fovea wanting; pleuræ coarsely sculptured, with the propleuræ basally bright pale fulvous; metanotum flavous, rugosely punctate, convexly declivous and basally obliquely impressed; areola short and broad, laterally curved and obliquely constricted, emitting a carina extending to the apex from each of its apical angles; apophyses large, laterally broadly dilated, with a round fovea on the top; lateral carinæ distinct; metapleuræ flavescent, closely and transversely strigose. *Scutellum* rugose and densely white-pilose, black, with its strongly strigose sides and rounded apex broadly, and the postscutellum entirely, white. *Abdomen* black; basal segment as long as the second, with its sides, apex and basal half flavous, centrally bicarinate, with the apical half strongly and closely punctate and white-pilose: the closely punctate second and third segments apically and laterally flavous;

sides of segments acutely margined and pale flavous beneath; anus broadly flavous; terebra 2 millim. in length. *Legs* fulvous, with the anterior coxæ and trochanters flavidous, the former black behind and laterally above; hind coxæ black, strongly punctate and densely white-pilose. *Wings* hyaline, with the stigma and nervures black, tegulæ flavous; radial cell lanceolate at both extremities; submarginal nervure curved and emitted from the cubital a little before the broadly fenestrate second recurrent.

Length 10 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum; the hind legs are missing from the coxæ.

6. **Chreusa lutea**, *Cam.*

Chreusa lutea, Cameron,* Manch. Mem. 1899, p. 212 (♀).

A ferruginous species, with the coxæ and the base of the antennæ red. *Head* distinctly broader than the thorax, ferruginous, with the punctate and laterally white-pilose face stramineous; clypeus punctate, with white pilosity, its apex rounded and clearly discrete; mandibles stramineous, with their apices black and triangularly bidentate; vertex somewhat coarsely punctate; frons excavate and centrally elevated, with the elevation laterally carinate. *Antennæ* longer than the body and slightly incrassate towards their apices, black, with the scape and first flagellar joint red, the sixth to ninth clear white and darker above. *Thorax* ferruginous; pronotum apically triangularly prominent, with a second rounded projection on the disc, propleuræ stramineous and stoutly strigose below; mesonotum closely punctate and very shortly pubescent; mesopleuræ coarsely punctate above and strongly strigose below, with broad, deeply impressed and vertically trans-striate sternauli; metanotum large and closely rugose, with the basally broad and laterally oblique areola, external areæ, transversely strigose and laterally subparallel-sided petiolar area, and the large, apically rounded spiracular areæ, distinct. *Scutellum* longer than broad, apically constricted, stoutly carinate laterally at the base, with the basal fovea broad and deeply impressed. *Abdomen* ferruginous, with the closely punctate second and third segments

Fig. 5.—*Chreusa lutea,* Cam.

apically, laterally and ventrally stramineous; basal segment a little longer than the second, broad, with the petiole narrow, bicarinate to apex and laterally carinate to the spiracles; terebra 2 millim. in length. *Legs* red; apices of hind femora, of their tibiæ more broadly, and their tarsi (except basally), black. *Wings* hyaline; stigma black and basally paler, second recurrent nervure broadly fenestrate.

Length 7 millim.

The stoutly bidentate mandibles and impressed prescutellar fovea of this species render it very distinct from the last; superficially its colour will distinguish it at a glance.

ASSAM: Khasi Hills (*Rothney*).

Type in the British Museum.

Genus HEMIGASTER, *Brul.*

Hemigaster, Brullé, Hist. Nat. Ins. Hym. iv, 1846, p. 266.

GENOTYPE, *H. fasciata*, Brullé.

Head short and broad; eyes large and margined, with the inner orbits stoutly carinate apically; frons broadly and deeply impressed, with its centre tricarinate; face distinctly carinate longitudinally in the centre; mandibles apically bidentate. Antennæ somewhat elongate and incrassate towards their acuminate apices. Mesonotum not trilobate, though with the notauli distinct; metanotal areæ complete, with large and linear spiracles. Scutellum stoutly carinate. Basal abdominal segment with the distinct petiole discally bicarinate, apically curved, and small circular spiracles at base of its apical third part; gastrocœli of second segment obsolete; three basal segments very large, remainder small; terebra shorter than half the abdomen. Tarsi spinose, with their claws simple. Areolet wanting; radial cell large and broad, with its apical half broadly lanceolate; first recurrent nervure of hind wings angled and intercepted.

Range. India and Australia.

The two species originally described in this genus have the antennal joints much longer than broad, with the scape reflexed and broadly emarginate externally; the legs are of normal length and breadth, with the fourth tarsal joint small and not bifid; the mesothorax is broad and the metanotum declivous throughout.

Its name is derived from the strongly developed three basal segments, beneath which the remainder of the abdomen is telescoped and, in the typical species, hidden; consequently the abdomen has a somewhat broad oval form, with the basal segment somewhat elongately triangular and posteriorly broad, sides a little concave, and the petiole rather broad. Brullé remarks (*l. c.* p. 267) upon the comparative similarity between the Cryptogastrid Braconids and the present genus, also referred to by Marshall (Bracon. d'Europ. i, p. 26).

This genus may at once be known from *Macrogaster* by its complete metanotal areæ, angled and intercepted second recurrent of the hind wing, and the much shorter terebra.

Cameron says (Manch. Mem. 1899, p. 193) that *Hemigaster* has the same neuration as *Macrogaster*, but that in other respects it is very dissimilar:—in not having the mesonotum trilobate, the spiracles between the centre and apex of the petiole, the three basal segments greatly enlarged, the head smaller and the petiole bicarinate. Though he considered *Macrogaster* to belong to the PIMPLINÆ, he would place his species of *Hemigaster* between the ICHNEUMONINÆ and CRYPTINÆ; they are, however, associated in a small group by themselves, in the middle of the CRYPTINÆ, by both Ashmead and Dalla Torre, possibly for no better reason than that Brullé placed them in his third "type," *Les Cryptus*, in which section, however, was also included *Agriotypus*, Curt.!

Table of Species.

1 (2)	Postpetiole 4-carinate; face infuscate; flagellar band weak	*fasciatus*, Brul.
2 (1)	Postpetiole 2-carinate; face red; flagellar band clear white	*carinifrons*, Cam.

7. Hemigaster fasciatus, *Brul.*

Hemigaster fasciata, Brullé, Hist. Nat. Ins. Hym. iv, p. 267, fig. (♀).

A red species with a broad abdominal band, the posterior legs partly, and the white-banded antennæ, black. *Head* red, with the face and vertex laterally, and the lower orbits of the eyes, infuscate; face longitudinally prominent in the centre; mandibles apically black. *Antennæ* black, with the first two joints and base of the third red, and an incomplete central flagellar band flavescent. *Thorax* subpubescent, with the mesonotal notauli narrow, the lobes not at all convex, and the central one longitudinally subsulcate; metanotum broadly and deeply sulcate almost throughout, the petiolar area bicostate and divided into three polygonal areæ; apophyses distinct and obtuse. *Abdomen* red, with the three basal segments closely punctate; basal segment with four longitudinal discal carinæ and a longitudinal black stripe on either side of the disc; second with a black band, laterally rounded and not extending to the side margins, occupying the basal two-thirds; third segment basally subinfuscate; terebra 25 millim. in length. *Legs* red, with the anterior tarsi more or less infuscate; hind legs with the tarsi entirely, and femora and tibiæ towards their apices, black. *Wings* hyaline, with the nervures rufescent.

Length 10 millim.

"INDES ORIENTALES."

8. **Hemigaster carinifrons**, *Cam.*

Hemigaster carinifrons, Cameron,* Manch. Mem. 1899, p. 201 (♂ ♀).

Head red, with only the apices of the basally closely punctate and laterally carinate mandibles black; face and clypeus not separated, closely punctate and densely white-pilose, the latter basally foveate on either of its oblique sides and apically transverse; former with the central carina impressed at base and apex; vertex closely punctate, frons glabrous and excavate, with a central longitudinal acute carina, obliquely inflexed and having on either side another short basal carina; upper orbits elevated and acutely carinate; occiput bordered. *Antennæ* as long as the body, black, with the two basal and base of the third joints red, and the seventh to eleventh clear white. *Thorax* red, with the propleuræ closely punctate, stoutly and obliquely strigose below; mesothorax closely punctate, with the notauli narrow but distinct and the sternauli deeply impressed, curved and crenulate; mesopleuræ obscurely strigose above, with a central, crenulate sulcus, which is broadly black on either side; metanotum centrally glabrous, laterally closely punctate, with its external and apical parts strigose; areæ entirely demarcated and clearly defined; areola obliquely declivous basally, carinate throughout and obliquely constricted apically, whence two apically subdivergent carinæ extend to the petiole; external basal areæ entire and broader than long; dentiparal areæ of about the same size and centrally emarginate externally; petiolar area twice as long as broad; spiracular areæ large, deeply and obliquely impressed basally, broader than long and separated from the anterior by a stout carina; apophyses large, foliaceous and transverse; spiracles linear, oblique, narrow and rounded at both extremities; metapleuræ shagreened. *Scutellum* elevated, longer than broad, closely punctate and infuscate-pilose, apically constricted, with its sides and apex stoutly carinate; postscutellum carinate laterally, apically explanate and bicarinate vertically. *Abdomen* red and, except the basal segment, closely punctate, with short and dense white pubescence; first segment basally smooth and constricted, apically closely punctate, dilated and curved, laterally and beneath and on the postpetiole bicarinate; three basal segments large and subequal in length, remainder much shorter and decreasing in length towards the anus. *Legs* subelongate; anterior testaceous, with the coxæ broadly at the base above, and their

Fig. 6.
Hemigaster carinifrons, Cam.

onychii, black; hind legs black, with the coxæ, trochanters, and base (or in ♂ underside) of the femora rufescent, the apical third of the densely setiferous tibiæ and the tarsi, except their onychii, stramineous, or in ♂ testaceous; calcaria slightly longer than half the spinose metatarsi; third tarsal joint double the size of the fourth; claws curved and simple. *Wings* clear hyaline throughout; stigma fulvidous, nervures and ♂ stigma darker; cubital nervure basally oblique, nervelet distinct.

Length 8 millim.

Assam: Khasi Hills (*Rothney*).

Types ♂ ♀ in the British Museum.

This species is remarkable for the strongly curved median nervure of the hind wings and the Cryptoid basal abdominal segment.

Genus **ARTHULA**, *Cam.*

Arthula, Cameron, Manch. Mem. 1900, p. 110.

Genotype, *A. brunneocornis*, Cam.

♂ only. Head not strongly buccate behind the large and internally parallel eyes, which do not extend to the base of the stout, short, and equally bidentate mandibles; clypeus small, separated from the face and obliquely impressed transversely at the apex; labrum prominent and rounded. Antennæ stout, of 29 joints, and but little attenuate apically. Notauli distinct and reaching centre; metanotum with a single transverse carina near the base, its spiracles linear, somewhat large and rounded at both extremities. Scutellum large and convex. Basal segment curved and gradually subexplanate apically, with spiracles shortly beyond the centre; second segment triangular, basally narrow and gradually explanate to the transverse apex, with indistinct gastrocœli; the third to fifth segments broader than long, and with large lateral impressions, their centres being roundly elevated; hypopygium large, flat and apically triangular. Legs elongate, hind coxæ large, with the basal joint of their trochanters longer than twice the apical; tarsi spinose, with the metatarsi longer than the remaining joints; front tibiæ with no calcaria. Wings with no areolet, and the single submarginal nervure so abbreviated that the cubital and radial nervures almost coalesce; fenestræ distinct; discoidal nervure obliquely curved on the basal half.

Range. Assam.

"The short thick antennæ with comparatively few joints" (says Cameron, *loc. cit.*) "and the similarity in the alar neuration, might place it near *Acœnitus*. In the absence of the ♀, its exact relationship cannot be very clearly defined. It comes nearest to the Tryphonides and is closely related to *Chreusa*, *Hemigaster*, and *Macrogaster*, with which it agrees in the neuration of the wings and in the paucity of joints in the antennæ, but may be known from all of them by the median segment having only one

transverse keel, and consequently no areæ; by the metatarsus being longer than all the other joints united, and by the more slender petiole."

9. **Arthula brunneocornis**, *Cam.*

Arthula brunneocornis, Cameron,* Manch. Mem. 1900, p. 112 (♀).

♂. *Head* black, with the deplanate and closely punctate face, the basally prominent and apically obliquely impressed clypeus (except its base), the labrum and all the orbits, pale flavous; mandibles, except before their apices, black; the vertex and the longitudinally sulcate frons, closely punctate. *Antennæ* as long as the abdomen, stout and hardly attenuate apically, piceous and darker above, with the scape bright flavous. *Thorax* black, with a broad pronotal band, the propleuræ below, callosities at the front and hind radices, a mark at the apex of the notauli, a

Fig. 7.—*Arthula brunneocornis*, Cam.

transverse band at the base of the mesopleuræ, a large mark on either side of the closely punctate mesosternum and a large triangular mark at the apex of metanotum, pale flavous; mesonotum dull and, like all the pleuræ, closely punctate, with the notauli extending to its centre; propleuræ strongly and irregularly strigose centrally; metanotum strongly punctate and striolate, basally finely and closely punctate before the transverse carina. *Scutellum* somewhat strongly but not very closely punctate, with a centrally constricted flavous mark on its apical half, and its basal fovea glabrous; postscutellum, scutellar carinæ and the space on either side, flavous. *Abdomen* dark ferruginous, with the petiole centrally, and the base of all the segments, black. *Legs*: anterior pairs pale fulvous, basally flavescent, with the coxæ

basally black; hind legs darker fulvous, with coxæ and tarsi yellower; hind coxæ broadly black internally at the base and externally at the apex, their trochanters broadly black above and the femora black above at the base. *Wings* clear hyaline; stigma infuscate, nervures darker, and tegulæ flavous.

Length 11–12 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum, labelled *brunneicornis* by its author.

Tribe *ACÆNITIDES*.

This tribe consists of several aberrant genera, of which *Acœnitus* and *Collyria* appear sufficiently closely related. Of the rest, *Coleocentrus* is intermediate between the PIMPLINÆ and the Ophionid genus *Anomalon*; *Œdematopsis* might with more propriety be placed in the TRYPHONINÆ, near *Thymaris*; and the exclusively Indian *Tanera* was thought by its author to appertain to the LISSONOTIDES. If relegated to the PIMPLINÆ, which would seem their most natural position in our artificial classification, all fall into the present tribe on account of their elongate hypopygium, which entirely conceals the base of the terebra, and in many cases extends to or even beyond the abdominal apex. The first three genera are stout insects, with elongate and incrassate hind legs, and short, subclaviform antennæ; the last two are much more slender, with elongate and filiform antennæ, which often exceed the body in length, and with the legs normal and slender. As already remarked, it is exceedingly probable that the distinction between this group and the last is less than has hitherto been supposed; and some of Cameron's species included therein should, quite possibly, be placed in the present tribe, since he himself was uncertain concerning their position. No hosts of the Indian species have yet been noted.

Table of Genera.

1 (6)	Hind legs stout or elongate; antennæ about half length of body.	
2 (5)	Areolet wanting; metathoracic spiracles elongate.	
3 (4)	Head transverse; hind tibiæ stout; hypopygium acuminate	ACÆNITUS, Latr., p. 40.
4 (3)	Head subcubical; tibiæ normal; hypopygium subtruncate........	COLLYRIA, Schiöd., p. 45.
5 (2)	Areolet triangular; metathoracic spiracles oval..................	COLEOCENTRUS, Grav., [p. 47.
6 (1)	Hind legs normal; antennæ about as long as body.	
7 (14)	Areolet entirely wanting.	

8 (9)	Clypeus as long as face; nervellus entirely wanting	[p. 49. ŒDEMATOPSIS, Tschek,
9 (8)	Clypeus shorter than face; nervellus distinct.	
10 (11)	Face transverse; terebra nearly as long as abdomen	[p. 51. ACÆNITELLUS, gen. nov.,
11 (10)	Face not transverse; terebra shorter than abdomen.	
12 (13)	Metathoracic spiracles circular; basal segment of abdomen simple.	THYMARIS, Först., p. 52.
13 (12)	Metathoracic spiracles linear; basal segment of abdomen intumescent.	[p. 54. BOLODERMA, gen. nov.,
14 (7)	Areolet distinct and elongately petiolate	TANERA, Cam., p. 56.

Genus **ACÆNITUS**, *Latr.*

Acœnites, Latreille, Gen. Crust. et Ins. iv, 1809, p. 9.

GENOTYPE, *Ichneumon dubitator*, Pz.

Head transverse, subbuccate, and not narrowed behind the oval and entire eyes; clypeus short and transverse, deeply and semicircularly separated from the square face, the apical margin subtruncate and centrally reflexed; mandibles longitudinally striate, usually apically bifid with the upper tooth more obtuse; ligula exserted; antennal scrobes deeply impressed; genal costa inflexed. Antennæ filiform, as long as or rather longer than half the body. Thorax stout and strongly convex, with the notauli very distinct; mesosternum short, with indications of lateral sulci; metathorax short and rugose, with often indistinct areæ, spiracles large and elliptic, or linear. Abdomen smooth, as long as head and thorax, somewhat narrower and subcompressed apically, subsessile, convex and oblong, more constricted and longer in ♂ than in ♀; basal segment smooth and subcanaliculate, hardly dilated apically, narrower in ♂; sixth of ♀ ventrally concave and elongately acuminate; terebra from about half to fully length of body. Hind legs elongate and incrassate, with the tarsal claws large, curved, and not pectinate; front tibiæ with one spur. Wings with no areolet; the upper pair with basal nervure perpendicular and not curved, fenestræ large and nearly confluent; lower ones with the first recurrent postfurcal or subopposite.

Range. India, Africa, Europe and North America.

Gravenhorst has called attention to the relationship of this genus with *Lissonota*, *Coleocentrus*, *Arotes*, and *Collyria*. It is, however, abundantly distinct from any of these, and probably most closely related to *Lampronota*, though the superficial resemblance to the Braconidous genus *Helcon* is, as remarked by Haliday (Ent. Mag. 1836, p. 143), curiously striking. Its species are known to prey upon the lignivorous Lepidopterous larvæ of the SESIIDÆ, and the imagines are attracted to umbelliferous flowers.

Table of Species.

1 (4) Head and thorax black; metanotum fully costate.	
2 (3) Wings with substigmal cloud; hind tibiæ pale red	*grandipes*, sp. n., p. 41.
3 (2) Wings with no cloud; hind tibiæ black..........................	*alecto*, sp. n., p. 42.
4 (1) Head and thorax flavous; metanotum only basally costate.	
5 (6) Nervelet wanting; metanotum glabrous..........................	*xanthorius*, sp. n., p. 43.
6 (5) Nervelet distinct; metanotum roughly punctate	*biumbratus*, sp. n., p. 44.

10. **Acænitus grandipes**, sp. n.

♀. A handsome black species with pale-banded antennæ and body, spotted wings, and fulvidous legs. *Head* stout, with the distinctly bordered occiput narrower than the internally entire eyes; vertex smooth, with a few isolated punctures, frons glabrous and very strongly carinate to the rugose and white face; frontal and external orbits, cheeks, and the apically truncate clypeus white; mandibles black, strongly striate, and apically attenuate. *Antennæ* filiform throughout, black, with the ninth to twenty-second flagellar joints, and the scape beneath, white; apices ferruginous and abruptly obtuse. *Thorax* black, unevenly punctate, with short white pilosity; mesonotum somewhat dull, discally rugose, with its notauli deeply impressed and their central lobe vertical; metathorax strongly costate, with the areola small and exactly quadrate; petiolar area reaching beyond centre, laterally sinuate, apically glabrous, and basally trans-aciculate; lateral areæ irregularly costate; apophyses obtuse; spiracles large and linear, circumcostate. *Scutellum* black, with a few large punctures, laterally carinate to the centre, with its basal fovea bicarinate and its extreme apex obscurely testaceous; postscutellum glabrous and entirely stramineous. *Abdomen* narrower than the thorax, nitidulous and subimpunctate, with the apices of all the segments broadly flavous; basal segment sparsely and longitudinally punctate laterally, with the spiracles before its centre; gastrocœli foveiform; venter flavous, with the hypopygium spinous and extending over the base of the centrally testaceous terebra to beyond the pygidium; terebra longer than the abdomen. *Legs*: anterior pair entirely stramineous, with the apices of the onychii and of the bifid claws alone infuscate; hind legs fulvous with the coxæ, apices of trochanters, of femora, of the curved tibiæ and extreme base of the last, black; coxæ internally above, base of trochanters, and the tarsi, except their simple claws, white. *Wings* infuscate-hyaline, with a mark below the black stigma and the apices of both pairs distinctly infumate; radix testaceous, tegulæ white, nervelet obsolete; the bifenestrate second recurrent nervure intercepting the cubital, but slightly

beyond the single submarginal nervure; first recurrent of hind wings subopposite and emitting the apically curved nervellus from its exact centre.

Length 13 millim.

NICOBAR ISLANDS (*Col. C. T. Bingham*).

Type in the British Museum.

This species is probably referable to Förster's subgenus *Chorischizus*: the specimen I have examined possesses a curious malformation of the inner right hind tarsal claw, which is strongly constricted centrally, and thence cleft into two branches, superficially resembling the bifid anterior claws; the left is normal.

11. Acænitus alecto, sp. n.

♂. A handsome black species, with black antennæ and body, uniformly clouded wings, and pale legs. *Head* stout, with the distinctly bordered occiput as broad as the internally entire eyes; frons smooth and dull, with distinct irregular punctures, finely and obsoletely carinate only between the small scrobes; face

Fig. 8.—*Acænitus alecto*, Morl.

large, closely, strongly and evenly punctate, and, like the mouth, cheeks, and orbits to above scrobes, flavous; clypeus glabrous, impressed throughout its apex, imperfectly separated by a circular fovea on either side; mandibles with the black apical teeth of equal length and their base not broader than the length of the cheeks. *Antennæ* fully as long as the body; flagellum 34-jointed, filiform and becoming a little attenuated apically, with the apices of all the joints subnodulose; black, with the scape flavous beneath and variegated above. *Thorax* black, unevenly punctate, with short white pilosity; mesonotum somewhat dull, with its notauli deeply impressed and their central lobe vertical; metathorax strongly costate, with the areola small and exactly

quadrate, the basal area narrower and the petiolar short, laterally sinuate, apically glabrous, and the lateral areæ irregularly costate; apophyses large and obtuse: spiracles large, linear, and circumcostate. *Scutellum* black, deplanate and finely punctate throughout, laterally carinate to the centre, with its basal fovea quinquecarinate; postscutellum glabrous. *Abdomen* much narrower than the thorax, with its apical half strongly compressed and laterally clavate; three or four basal segments nitidulous and impunctate; apices of all the dorsal and ventral segments very narrowly testaceous; basal segment elongate, centrally sulcate to its apical third, with a row of punctures on either side and the spiracles a little before its centre; gastrocœli obsolete, extreme anus testaceous. *Legs*: anterior pair entirely stramineous, with the apices of the bifid claws alone infuscate, front calcaria strongly curved; hind legs stout and elongate, black, with the trochanters flavescent, femora except at apex fulvous, and the tarsi, except the simple claws and basal half of first joint, stramineous. *Wings* uniformly infuscate-hyaline with the external margin hardly darker; radix rufescent, tegulæ black, nervelet obsolete; the bifenestrate second recurrent nervure intercepting the cubital very distinctly before the single submarginal nervure; the first recurrent of hind wings subopposite and emitting the apically curved nervellus from very distinctly above its centre.

Length 13 millim.

Sikkim (*Col. C. T. Bingham*).

Type in the British Museum.

This insect may prove to be the alternate sex of that last described; but, in view of the divergences of their frontal and venational conformation, the scutellar and tibial colour and alar infumescence, it were better for the present to treat them as distinct, especially since the only individual I have seen of *A. alecto* was captured by Bingham in Sikkim at an altitude of 4000 feet in April, 1894, or some thirteen hundred miles from the Nicobar Islands.

12. **Acænitus xanthorius**, sp. n. (Plate I, fig. 1.)

♂ ♀. A flavous species, with sparse black markings, and the alar apices alone infumate. *Head* flavous, with the ocelli, apices of mandibles, the distinct occipital border narrowly in the centre, and in ♀ the entire vertex, black; frons and vertex deeply and isolatedly punctate, the former with the scrobes large, glabrous, and centrally strongly carinate to the coarsely and rugosely punctate face; clypeus similarly sculptured, apically truncate, and in ♂ not basally discrete. *Antennæ* filiform and abruptly obtuse apically, black, with the scape and basal flagellar joints flavidous beneath; in ♂, the 19th to 21st joints (far beyond the centre) stramineous. *Thorax* evenly and distinctly punctate, flavous; of ♂ immaculate, of ♀ with a broad vitta on either side of the deeply impressed notauli, a spot on the longitudinally

subsulcate and anteriorly vertical central lobe, a dot before the radical callosities and on the centre of the mesopleuræ, the minute and transverse areola, and the strongly costate external areæ entirely, black; metanotum glabrous, with longitudinal costæ emitted from beyond the centre of the external areæ and bifurcating to the apex at the obsolete apophyses, where they are intercepted by the basally wanting costulæ; spiracles large and linear. *Scutellum* not small nor laterally carinate, evenly and not closely punctate, with pale pilosity. *Abdomen* nitidulous, subglabrous and apically pilose, of ♀ fusiform, of ♂ narrower; flavous, with the base of the third and fourth segments obsoletely black, ♀ with all the segments basally black except the first; basal segment finely punctate, gradually a little explanate throughout, with subcentral spiracles; venter flavous, ♂ valvulæ exserted, hypopygium of ♀ extending to the apex and covering the base of the apically incrassate valvulæ; terebra as long as the abdomen. *Legs* flavous, the hind ones stout, elongate, and in ♀ with a discal coxal spot; the tarsi, extreme apices of trochanters, of femora, and base of their hardly curved tibiæ, black; anterior claws bifid; ♂ hind tarsi infuscate. *Wings* hyaline, with all the apices alone infumate; radix, tegulæ, and base of costa flavous; costa and stigma black; areolet and nervelet wanting: second recurrent emitted from external cubital only slightly in ♂, and very distinctly in ♀, beyond the single submarginal nervure; first recurrent of lower wing subopposite, emitting the curved nervellus from slightly (in ♂ distinctly) below its centre.

Length 8–10 millim.

Sikkim, iv.–vi. 1900 (*Col. C. T. Bingham*).

Type, ♀, in the British Museum.

Described from two males and a female.

This distinct species belongs to Förster's subgenus *Phænolobus*, and, with the following, appears to bear the same relationship to *Acænitus* that *Xanthopimpla* has to *Pimpla*.

13. **Acænitus biumbratus**, sp. n.

♀. A flavous species, with sparse black markings, and two infumate alar marks. *Head* flavous, with the ocelli, apices of mandibles, and the distinct occipital border centrally, black; frons and vertex deeply and somewhat sparsely punctate, the former with the scrobes large, glabrous, and centrally strongly carinate to the centre of the coarsely and rugosely punctate face; clypeus similarly sculptured, apically truncate, and basally indistinctly discrete. *Antennæ* abruptly obtuse and slightly incrassate apically, black, with the scape and basal flagellar joints flavidous beneath. *Thorax* evenly and distinctly punctate, flavous, with a broad stripe on either side of the deeply impressed notauli, a striolate spot at the base of the entire and anteriorly vertical central lobe, a dot behind the tegulæ, and the narrow,

strongly costate, external areæ entirely, black; metanotum rugulose, with the costæ indistinct and obsolete, apophyses distinct but obtuse, spiracles linear and short. *Scutellum* not small, nor laterally carinate beyond its multicostate basal fovea, evenly and not closely punctate, with pale pilosity, and its apical third, like that of the glabrous postscutellum, black. *Abdomen* nitidulous, finely and closely punctate, apically pilose and subcompressed; flavous, with the base of all the segments, except the first, basally black; first black on either side before its centre; venter flavous, hypopygium extending to the apex and covering the base of the apically black, but not incrassate, testaceous valvulæ; terebra as long as the abdomen. *Legs* testaceous; hind pair stout and elongate with the coxæ basally above, the onychii, and the base of the hardly curved tibiæ, black; anterior claws bifid. *Wings* hyaline, the anterior pair with their apices broadly, and a substigmal spot deeply, infumate; radix, the anteriorly black-spotted tegulæ, and the base of the costa, flavous; costa and stigma black; areolet wanting, nervelet distinct and nearly as long as the submarginal nervure, which is emitted from the cubital but shortly before the recurrent; first recurrent of lower wings exactly opposite, emitting the curved nervellus from its centre.

Length 8 millim.

SIKKIM (*Col. C. T. Bingham*).

Type in the British Museum.

The distinct nervelet, strongly transverse intermediate segments and elongate hypopygium place this species in Förster's subgenus *Chorischizus*, though it is certainly congeneric with *A. xanthorius*, with which its coloration is almost identical.

Genus **COLLYRIA**, *Schiöd.*

Collyria, Schiödte (*nec* Brullé), Mag. Zool. 1839, Ins. p. 10.
Pachymerus, Gravenhorst, Ichn. Eur. iii, 1829, p. 721 (*part.*).

GENOTYPE, *Pachymerus calcitrator*, Grav.

Head cubical, with the eyes pilose and somewhat large; cheeks buccate, not elongate, with the costa sharply inflexed; clypeus hardly discrete, apically truncate and centrally produced. Antennæ shorter than the head and thorax; scape a little excised, flagellum basally subattenuate. Thorax elongate; pronotal epomiæ conspicuous above; notauli apically distinct; mesosternum elongate, with no lateral sulci; metathorax long, with distinct longitudinal, but no transverse, costæ; spiracles small and obliquely linear. Abdomen elongate and apically subcompressed; basal segment parallel-sided, with central spiracles; ventral valvulæ not vomeriform, but covering the base of the short and straight terebra. Anterior legs slender; the hind pair strong and stout, their tibiæ straight and longer than the incrassate femora, calcaria short, tarsi elongate with the claws

and pulvilli stout. Wings with the stigma narrow and with no areolet; apical abscissa of radial nervure nearly twice as long as the basal; lower angle of discoidal cell subacute; fenestræ discreted and not small. Lower wings with the first recurrent very strongly postfurcal and intercepted by the nervellus far above its centre; second recurrent centrally pellucid.

Range. Europe, North Africa, China and Ceylon.

This genus was for long treated as appertaining to the OPHIONINÆ; its stout and elongate hind legs, very indistinctly subpetiolate abdomen, cubical head, and the conformation of the mouth parts and antennæ certainly ally it far more closely with *Accenitus*, as was indicated by Thomson in 1877; and it appears to bear only a very distant analogy with *Pristomerus vulnerator*, its congeneric species in the Gravenhorstian system, which is a true Ophionid and closely related to the genus *Cremastus*.

Motschulsky's description of our two species is so short and vague that it is quite impossible to tell nowadays whether they should be placed in the PIMPLINÆ or OPHIONINÆ; but, since no mention is made of femoral dentation, it is far more probable that, if correctly placed in the Gravenhorstian genus by their author, they should now find a place in that of Schiödte; but I have seen nothing similar from Ceylon.

Table of Species.

1 (2) Shining; antennæ basally and petiolar fascia red	*unifasciatus*, Mots.
2 (1) Dull; antennæ basally infuscate; petiole black	*gracilipes*, Mots.

14. Collyria unifasciatus, *Mots.*

Pachymerus unifasciatus, Motschulsky, Bull. Soc. Imp. Nat. Moscou, 1863, p. 29.

An elongate, nitidulous, black species, with the head nearly a quarter the length of the whole body in breadth. *Head* deplanate and shining, with the clypeus densely and finely punctate and pilose; eyes large, with a brazen reflection; palpi testaceous-red. *Antennæ* basally testaceous-red. *Thorax* with the mesonotum as broad as the head, glabrous, with the notauli deeply impressed and basally convergent. *Abdomen* slender, compressed and subtriangularly dilated posteriorly; basal segment with the petiole elongate and black, with a testaceous-red fascia. *Legs* testaceous-red, with paler coxal marks; the hind femora simple, narrow and centrally, like the apices of their tibiæ, subinfuscate.

Length 4 millim. Sex not noted.

CEYLON: Nuwara Eliya (*teste* Motschulsky).

It should be noted that in the original descriptions of this and the following species their author appears to have transposed our modern rendering of the terms pro- and mesonotum; thus, he writes of *P. unifasciatus* "pronoto capitis latitudine, longitudinaliter biimpresso" and of *P. gracilipes* as "pronoto subovato."

15. **Collyria gracilipes**, *Mots.*

Pachymerus gracilipes, Motschulsky, Bull. Soc. Imp. Nat. Moscou, 1863, p. 30.

An elongate, narrow, black and hardly shining species, with the head nearly one-fifth the length of the whole body in breadth. *Head* deplanate, subtransverse and testaceous-red, with only an occipital mark black; eyes normal, oblong and deep black. *Antennæ* nearly as long as the body and basally infuscate. *Thorax* elongate; pronotum and all the pleuræ testaceous-red; mesonotum subovate, convex, centrally impressed and rufescent; metanotum elongate, shining and apically constricted. *Abdomen* narrow, compressed, shining, posteriorly dilated, discally more or less infuscate, with its centre and venter testaceous; basal segment black and parallel-sided. *Legs* slender, testaceous and with fuscous markings, with the hind femora narrow. *Wings* ample, with the large stigma infuscate-testaceous and the nervures dark.

Length 5 millim. Sex not noted.

CEYLON: summit of Mount Patannas (*teste* Motschulsky).

The large alar stigma, normal-sized eyes and elongate antennæ render this species probably more closely allied to *Pristomerus*, Curt., than to *Collyria*, Schiöd.; it may be the alternate sex of *Pristomeridia marginicollis*, described by Cameron in 1907 (Tijds. Ent. p. 110) from Sikkim.

Genus **COLEOCENTRUS**, *Grav.*

Coleocentrus, Gravenhorst, Ichn. Eur. iii, 1829, p. 437; Thomson, Opusc. Ent. viii, p. 732.

Macrus, Gravenhorst, *op. cit.* p. 707.

GENOTYPE, *Ichneumon excitator*, Poda.

Head transverse and subbuccate, eyes oval; cheeks not short, genal costa inflexed; clypeus short and discrete, apically produced in the centre; mandibular teeth subequal. Antennæ filiform and shorter than the body; those of ♂ slender. Thorax subcylindrical; mesothorax laterally subquadrate, notauli deeply impressed and reaching the centre of the mesonotum, mesosternum not transverse with no lateral sulci, epicnemia obsolete; metathorax rugose, with a few longitudinal costæ only, spiracles distinct and oval. Scutellum triangular and strongly convex. Abdomen subsessile, convex, as broad as and twice as long as the thorax, apically compressed; ventral valvulæ of ♀ acute and vomeriform; basal segment subparallel-sided and distinctly deplanate; the second and third with lateral oblique impressed lines, and in ♂ the incisures broad and deeply impressed; seventh and eighth large and produced; anus subacuminate; terebra nearly as long as the body. Legs long and somewhat slender. Wings ample, with the areolet small, triangular and petiolate; upper wings with the lower basal nervure pellucid, the upper basal strongly oblique and not curved; radius emitted from before the centre of the narrow

stigma, and longer basally than apically; fenestræ minute and broadly discreted; recurrent nervure hardly sinuate; lower wings with the first recurrent strongly postfurcal.

Range. Europe, Sikkim, Burma, Japan, Malay Archipelago, Tasmania, Texas, Canada.

The head, thorax, and legs resemble those of *Ephialtes*, but the abdomen and wings are more similar to those of certain OPHIONINÆ.

This genus, a ♀ of which is figured by Ratzeburg (Ichn. Forst. iii, p. 94), was placed by Gravenhorst under *Banchus* and originally contained females only, since he erroneously relegated the males to his Ophionid genus *Macrus*. They were united by Wesmael, in his "Notice sur les Ichneumonides de Belgique appartenant aux genres *Metopius*, *Banchus* et *Coleocentrus*" in 1849, in which he states the opinion that they belong rather to the PIMPLINÆ. Thomson retains the genus in this position on account of the oblique incision of the basal segments, though indicating the affinity shown with the OPHIONINÆ by the apically compressed abdomen.

16. Coleocentrus möllerii, *Bing.*

Coleocentrus möllerii, Bingham, Journ. Bomb. Nat. Hist. Soc. 1898, p. 116, pl. A, figs. 4, 4 *a*, 4 *b* (♀).

A very large black species, with profuse flavous markings. *Head* black, with the clypeus, face below antennæ, a dot at the frontal orbits, and the cheeks flavous; vertex with a few shallow punctures. *Antennæ* elongate and filiform, with the scape intumescent, flavous beneath and deeply emarginate externally; flagellar joints apically oblique. *Thorax* black, with the pronotum anteriorly and at its hind lateral angles, two short discal stripes on the oval, convex and transversely rugose mesonotum, mesopleuræ, the whole of the laterally flat, posteriorly rounded and apically obliquely sloped metanotum, and large spots on the metapleuræ, flavous. *Scutellum* punctate with its base, and a dot on either side, flavous; postscutellum very small and compressed. *Abdomen* nitidulous, with all the segments flavous-banded before the apex, the basal ones depressed and deplanate, the apical subcompressed; the two basal segments discally glabrous, the remainder finely punctate above at the base; flavous bands of the fourth and fifth segments laterally dilated, that of the sixth modified into a transverse diamond-shaped spot; terebra a little longer than one and a half times the length of the body (51 millim.), with the valvulæ ferruginous. *Legs* black; the front ones with the coxæ and trochanters apically, the femora in front, and whole of tibiæ and tarsi, flavous; posterior legs with coxal spots, the trochanters basally, the intermediate femora externally and apically, the apical half of the hind ones, the apical half of the intermediate tibiæ and the centre of the hind ones, flavous; posterior tarsi ferruginous.

Wings deep brownish flavous, with the nervures piceous; areolet sessile and entire; nervellus intercepting recurrent nervure of lower wing at its junction with the median.

Length 33 millim.

SIKKIM; TENASSERIM.

Type. Location unknown.

I am not quite satisfied that my friend Col. Bingham placed this female in its correct genus; he says that the terebra is "emitted from the apical segment, which with the next three segments, looked at from the ventral side, are ensheathed one within the other"; but this does not prove that its base is covered by the hypopygium; and his description of the "transversely plicated and rugose" mesonotum, with the figure of the sessile areolet and position of the nervellus, point rather to its inclusion in *Rhyssa*. Cameron (Zeits. Hym. Dipt. 1903, p. 302) is of the same opinion.

This species is probably widely distributed.

Genus **ŒDEMATOPSIS**, *Tschek.*

Œdemopsis, Tschek, Verh. z.-b. Ges. Wien, 1868, p. 276; id., *op. cit.* 1870, p. 430.
Œdimopsis, Thomson, Opusc. Ent. ix, 1883, p. 907.
(?) *Hybophanes*, Förster, Verh. pr. Rheinl. 1868, p. 216.
Œdematopsis, Morley, Ichn. Brit. iii 1908, p. 268.

GENOTYPE, *Tryphon scabriculus*, Grav.

Head subglobose; eyes small, entire, shortly and sparsely pilose; frons convex, mandibles bidentate, with the lower tooth the shorter; clypeus large and stout, apically broadly rounded or subtruncate; that of ♂ nearly flat, as long as the face and not broader than long, discrete, with the basal fovea on either side and apically subreflexed; clypeus of ♀ semicircularly discreted basally, very strongly convex and produced, with a fine transverse carina, intercepted by a conspicuous central subglobose tubercle, extending across its centre. Antennæ slender, filiform and a little shorter than the body. Thorax stout and subovate, with distinct notauli; metathorax apically attenuate and produced above the hind coxæ; upper and petiolar areæ present; spiracles circular and situated between the centre and base. Scutellum deplanate and apically obtuse; its basal fovea multistriate. Abdomen subpetiolate, with the second and third segments often punctate-rugose; that of ♂ sublinear, with all the segments longer than broad, the last apically attenuate; that of ♀ linear-subfusiform, with the three basal segments elongate and the remainder telescoped, apical ventral segment covering base of terebra, which is straight and not quite half the length of the abdomen. Legs slender, with the tarsal claws simple. Wings of normal breadth, with no areolet.

Range. Europe, Assam.

This genus differs materially from the XORIDINI in its close-

fitting mandibles, very large and not apically impressed clypeus, normally broad wings, and shorter terebra. I have found it necessary to modify but very slightly the generic diagnosis, in order to include the following Oriental form, which differs in having the metathorax not longer than high, in its less clearly defined areæ, smoother abdomen and the relative lengths of its segments. The alar nervures are also peculiarly disposed, the internal cubital coalescing with the first recurrent at its junction with the anal in such a manner that the anal is continuous with the median; in the hind wing the nervellus and all the apical nervures are wanting.

Its position is still a moot point; though strictly speaking the subsessile, and often rugose, abdomen, lack of all trace of areolet and distinctly exserted terebra, place it incontrovertibly in the PIMPLINÆ, among which its cubical head and elongate legs ally it most closely with the XORIDINI. Tschek says (*loc. cit.*) his genus is "a further contribution to the Austrian PIMPLIDÆ"; and Bridgman (Entom. 1879, p. 129) "that it ought to remain among the PIMPLIDÆ, and in Holmgren's section ii. A.a." (=XORIDINI). Thomson, however, places it in his subtribe THYMARIDES of the TRYPHONINÆ, and no doubt can remain that, wherever placed, it cannot be separated from *Thymaris*, a genus of far less Pimplid facies. On the whole, I am inclined to think with the last author and Gravenhorst; that, in spite of its cubical head and exserted ovipositor, it is a true Tryphonid and certainly not one of the LISSONOTINI, among which it is placed as synonymous with *Hybophanes* by Ashmead, who probably followed up Marshall's position for it at the end of *Phytodictus*. I still prefer to treat it here in its strict and perhaps more unnatural position in the PIMPLINÆ, which is further favoured by its now well authenticated ectoparasitic habits.

17. **Œdematopsis apollos**, sp. n.

Fig. 9.
Œdematopsis apollos, Morl.

♂. A flavous species, with only the eyes, ocelli, antennæ apically and before their white band, three mesonotal stripes, basal scutellar fovea, and the centre of the metanotum basally, black. *Head* broader than the thorax and strongly nitidulous, with only the face obsoletely punctate. *Antennæ* slender and basally subattenuate, with a conspicuous white band beyond their centre. *Thorax*: mesothorax and scutellum nitidulous, with the notauli deeply impressed, centrally coalescent and dividing the elongate deep black stripes; metathorax coriaceous, with only the transverse

petiolar area distinct; lateral carinæ strong. *Abdomen* linear and testaceous, with two small black dots on the apical third of the second segment, which is thrice as long as broad and half as long again as the equally finely sculptured third segment; basal segment very slender, rather more than twice as long as apically broad and strongly nitidulous; remaining segments pubescent, obsoletely punctate and dull; anal styles testaceous, and half the length of the basal segment. *Legs* slender and hardly elongate. *Wings* hyaline, with the radix and tegulæ flavous, stigma luteous and the nervures piceous, with the external cubital pellucid, and the apices of all those in hind wings wanting.

Length 8 millim.

Assam: Khasi Hills, 6000 ft., v. 1903 (*Rowland Turner*).

Type in the British Museum.

Described from a single specimen.

Genus **ACÆNITELLUS**, gen. nov.

Head discally cubical, with the eyes somewhat prominent, but not large or internally emarginate; ocelli small and not far apart; face convex and strongly transverse; clypeus deeply separated basally and broadly rounded apically, with its disc glabrous; mandibles elongate, somewhat slender and unidentate; cheeks very short. Antennæ of ♂ longer than the body, filiform, centrally white-banded, with their apical joints discreted and subattenuate. Thorax short and stout; notauli very deeply impressed and discally coalesced; metathorax very short, with strong and entire areæ. Scutellum neither small not carinate, its apex obtuse. Abdomen but slightly longer than the head and thorax, subsessile, glabrous, nitidulous, deplanate in ♂ and distinctly compressed in ♀; basal segment glabrous and very gradually explanate from base to apex, its disc elevated and the spiracles before the centre; second and third segments quadrate, rectangular and of equal length, the following transverse; terebra stout and nearly as long as the abdomen. Legs normal, with the hind ones neither elongate nor stout; onychii minute. Wings not large; areolet wanting, submarginal nervure very short and hardly half as long as the space between it and the superiorly broadly fenestrate second recurrent; basal nervure continuous; nervelet wanting; nervellus straight and subantefurcal, strongly intercepted almost at its lower angle.

18. **Acænitellus polypori**, sp. n.

♂ ♀. A small stout black species, with the clypeus, antennal base, whole metathorax, extreme apex of scutellum, the first and basal half of the second abdominal segment, and the legs entirely, deep red; ♂ with the ninth and tenth flagellar joints and the

tegulæ white. Metanotal areæ very strongly carinate; the basal one triangular; the areola quadrate and not longer than broad, apically indeterminate and emitting costulæ from its base; petiolar area broad, discreted, and subvertical. *Length* 5–6 millim.

Fig. 10.—*Acœnitellus polypori*, Morl.

Ceylon: Peradeniya (*E. E. Green*).

Type in the author's collection.

Mr. Green has sent me a dozen specimens of this distinct species, unfortunately in none too good condition (the females have no antennæ), which he bred from a decayed *Polyporus*-fungus at Peradeniya during June, 1905. They were obviously preying in it upon some species of fungivorous Coleopteron, just as the common Palæarctic Ophionid, *Thersilochus moderator*, L., preys in *Boletus igniarius* upon the Heteromerous beetle, *Orchesia micans*, Pz. (*cf.* Trans. Ent. Soc. Lond. 1907, p. 38).

Genus THYMARIS, *Först.*

Thymaris, Förster, Verh. pr. Rheinl. 1868, p. 151.
Thymarus, Thomson, Opusc. Ent. ix, 1883, p. 908.

Genotype, *T. pulchricornis*, Brischke.

Head as broad as the thorax, circularly narrowed behind the eyes, with the vertex only slightly broader than long; clypeus arcuately separated, subconvex and apically very slightly rounded; eyes densely and very finely pilose, prominent, large and extending to the base of the mandibles, which are weak and apically narrowed, with the lower tooth the smaller; cheeks obsolete and not buccate; face anteriorly contracted. Antennæ nearly as long as the body, unusually slender, with the flagellum filiform and scape compressed-globose. Thorax with the epomiæ rising nearly to the mesonotum; notauli somewhat elongate but usually not deeply impressed: mesosternum not transverse, flat, with the sternauli long and not deep; metathorax not dentate or rugose, with complete areæ: areola hexagonal and emitting costulæ before its centre; spiracles small and circular. Abdomen apically subcompressed: basal segment elongate, discally subconvex, nearly thrice as long as apically broad, aciculate throughout, with the base petiolate and the spiracles slightly behind the centre; second segment usually

quadrate and, at least in ♀, aciculate; third finely alutaceous beyond the centre, remainder glabrous; terebral valvulæ centrally incrassate and distinctly exserted. Legs very slender, with the hind coxæ oblong; hind tibiæ slightly incrassate before the base; front femora not spinose, the basal joint of their tarsi a little arcuate. Wings with no indication of an areolet; radius very slightly curved and emitted from the centre of the normally broad stigma; basal nervure hardly curved or oblique, and slightly divergent from the cubital; parallel nervure emitted far below centre of the brachial cell; nervellus antefurcal and intercepted far below the centre.

Range. North West Europe, Ceylon.

This genus must be retained in juxtaposition to *Œdematopsis*, with which it so closely agrees in its more salient features, although the body is more slender, the abdomen smoother and the head less cubical. It was originally placed by Förster in the Ophioninæ, and Bridgman considered it a division of *Cymodusa* in that subfamily; Thomson, however, discovered the obvious relationship of the above named genus with it, and includes them, under the group-name Thymarides, in the Tryphonid *Mesoleptina*, I think correctly; but Ashmead, in 1900, widely separates these two genera by leaving the present in its original position and placing *Œdematopsis* in the Pimplinæ. Both sexes bear a curious superficial resemblance to small *Microcryptus* or the more slender *Hemiteles*, and the aciculate abdomen is similar to that of *Panargyrops* (*Leptocryptus*).

19. **Thymaris clotho**, sp. n.

♀. A black species, with pale-marked abdomen and red legs. *Head* shining and pubescent, somewhat broader than the thorax, with the facial orbits impressed; palpi and mouth testaceous; clypeus apically testaceous, normal and transverse, basally subtuberculate in the centre, apically a little rounded and not depressed. *Antennæ* very slender, with the scape pale; flagellum tricoloured, black, with the two basal joints red and the eleventh to fifteenth white. *Thorax* shining and pubescent; notauli deeply impressed; areola transstrigose and longer than broad, subparallel-sided, basally rounded and apically truncate, emitting the costulæ near its base; basal area not short. *Abdomen* with the apical margin of the second and whole of the first segment dull testaceous; basal segment longer than the hind coxæ and trochanters, aciculate, slender and

Fig. 11.—*Thymaris clotho*, Morl.

centrally impressed; the second distinctly longer than broad, dull and finely aciculate; the quadrate third coriaceous, and the following shining; anus with stramineous markings; terebra as long as or slightly longer than the basal segment. *Legs* testaceous, hind ones rufescent; coxæ and trochanters pale; hind tibiæ basally paler and apically subinfuscate. *Wings* of normal breadth; radix and tegulæ flavous; stigma piceous.

Length 6 millim.

Ceylon: Galle, 5.ii.07 (*T. Bainbrigge Fletcher*).

Type in the author's collection.

This species bears a remarkable resemblance to the Palæarctic *T. pulchricornis*, Brisch. (*T. compressus*, Thoms.). Structurally it is rendered certainly distinct by the deeply impressed notauli and much more strongly emarginate occiput; otherwise it differs in having only the apex of the clypeus pale, the third and fourth flagellar joints black, the areola trans-aciculate and less parallel-sided, the basal segment of the abdomen entirely rufescent and the third immaculate black, with the second distinctly longer, and the third coriaceous; the head is broader, the anus more compressed and the size a little larger.

Genus **BOLODERMA**, gen. nov.

Eyes internally entire; occiput distinctly bordered throughout; clypeus scutelliform, and apically subproduced and narrowed; lower mandibular tooth much the longer and both apically obtuse. Antennæ as long as the body and apically subsetaceous, with a broad white band beyond the centre. Notauli fine and deeply impressed; mesopleuræ basally tuberculate below, with no sulci; metanotum entirely glabrous, with no indication of carinæ; petiolar area perpendicular, concave and centrally subtuberculate above; supracoxal carinæ alone indicated; spiracles linear and not small. Abdomen subpetiolate; basal segment explanate slightly throughout, elongate, with the spiracles distinctly before its centre and placed in a discal hump; hypopygium extending to the subcompressed anus. Wings with no areolet; nervelet short and distinct; second recurrent nervure emitted beyond the submarginal; nervellus subopposite and intercepted exactly in its centre.

At first I was at a loss regarding the natural position of this genus, and it is only a knowledge of the very rare *Arotes albicinctus*, Grav., which suggests this as the most natural place that can at present be assigned to it. To *Arotes* it appears allied in general facies and sculpture and in the distinctly longer lower mandibular tooth, though the face is simple. It is similar to the antipodean genus *Proboloides*, Morl. (Ichn. Brit. i, p. 160), in the shape of the metathoracic spiracles and the incrassate basal segment, though the hump is here before its centre, and the areolet and metathoracic areæ are wanting. I consider it most closely related

to the Platyurini, but its position there is precluded by lack of primary characters, the position of the petiolar spiracles and absence of the areolet.

I have seen but a single species.

20. **Boloderma cadmus**, sp. n.

♂. A strongly nitidulous, black and white species. *Head* a little transverse and nearly parallel-sided behind the not very prominent and internally entire eyes; occiput distinctly bordered throughout and centrally strongly emarginate above; vertex subdeplanate, shining and distinctly, though sparsely, punctate; frons flat and subglabrous; face deplanate, entirely glabrous, with a few large and shallow punctures; epistoma slightly prominent and apically circumscribed by a semicircular impression, rising from the deeply bifoveolate base of the scutelliform and apically subproduced clypeus, which is depressed and laterally contracted before its rounded apex; cheeks elongate, sulcate throughout and apically aciculate, with the genal costa continuous; mandibles strong, subparallel-sided, coarsely punctate-striate, with the two apical teeth, of which the lower is distinctly the longer, very obtuse; basal maxillary palpal joint short, and the remaining four both elongate and subincrassate apically. *Head* black, with a frontal dot, the cheeks and external orbits broadly, the face entirely, and the clypeus, excepting its lateral foveæ, pure white. *Antennæ* black, as long as the body, filiform and not very slender, with their apices slightly attenuate; scape deeply excised; flagellum of about thirty-five joints, all cylindrical, with the first half as long again as the second, and an eight-jointed white band well beyond its centre; scape white beneath. *Thorax* strongly nitidulous and black, with the notauli, the disc of the mesonotum and lines from the radices, propleuræ obscurely, very large apical marks on both meso- and metapleuræ, white; mesonotum closely and evenly punctate, with the notauli free, deeply impressed and reaching the disc, but not convergent; mesopleuræ finely punctate (more coarsely basally below) just above a carina the base of which is tuberculiformly produced, sulcus wanting; metanotum entirely glabrous, with no indication of carinæ, discally deplanate and glittering, with the petiolar area perpendicular, concave and centrally subtuberculate above; supracoxal carinæ alone indicated; spiracles linear and

Fig. 12.—*Boloderma cadmus*, Morl.

somewhat large. *Scutellum* and postscutellum white, normal and sparsely punctate. *Abdomen* linear, nearly half as long again as head and thorax, though much narrower, glittering, impunctate, white, with the basal half of the first seven segments, together with the first ventral basally, black; first segment three and a half times as long as apically broad, very gradually explanate throughout and black only to the spiracles, which are set in a strong hump distinctly before its centre. *Legs* elongate, slender, normal, black, with the trochanters, anterior coxæ, apices of femora and of the anterior tibiæ and tarsi, base of the hind tibiæ and whole of their tarsi, white; all the claws simple, strong and infuscate; hind femora and their coxæ simple and punctate. *Wings* ample and not narrow, siliceous, with no areolet; second recurrent nervure strongly curved, narrowly bifenestrate and emitted slightly beyond the submarginal; nervelet short but distinct; basal nervure subcontinuous; stigma, radix and tegulæ black; nervellus opposite and intercepted exactly in its centre.

Length 12 millim.

SIKKIM (*H. J. Elwes*).

Type in the British Museum.

Genus **TANERA**, *Cam.*

Tanera, Cameron, Spolia Zeylanica, 1905, p. 141.

GENOTYPE, *T. annulipes*, Cam.

Head distinctly narrow behind the large and basally subconvergent eyes; cheeks distinct; clypeus evenly convex, apically broadly rounded and basally discrete; occiput transverse and close to ocelli. Antennæ nearly as long as the body, with the apical joint longer than the penultimate, but shorter than the two preceding united. Metathorax evenly coriaceous throughout, with no trace of transverse carinæ; lateral metapleural carinæ strong; "the keel on the edge of the metasternum projects at the apex into a distinct tooth"; spiracles small and oval. Abdominal petiole elongate and slender, basally constricted and as long as the two following segments united; all the segments glabrous, nitidulous and longer than broad; terebra longer than half the body. Legs slender; hind coxæ thrice as long as broad; claws not pectinate. Wings with the areolet elongately petiolate, emitting the recurrent nervure from its apex; inner cubital nervure evenly curved; upper basal emitted from the median beyond the lower basal.

Range. Ceylon.

"The abdominal petiole is longer, more slender and narrower at the base than it is in *Lissonota.* If it is to be called 'sessile' in Ashmead's table (Proc. U.S. Nat. Mus. xxiii, p. 49) it would fit in near *Trevoria*, with which it cannot be confounded; if 'petiolate,'

then it would come in near *Atropha*," says Cameron, in erecting this genus; but the possibility of its belonging to the Acænitides does not appear to have occurred to him at all. I am, however, very strongly of opinion, from an examination of both the description and the figure of the typical species, that this is its most natural position, on account of the tapering petiole and elongate coxæ, though no mention is made of the anal conformation; there it appears so closely allied to the new Australian genus *Leptobatopsis*, Ashm. (*op. cit.* 1900, p. 47) as to be separable only by its simple tarsal claws.

21. **Tanera annulipes**, *Cam.*

Tanera annulipes, Cameron, Spolia Zeylanica, 1905, p. 141, pl. B. fig. 11 (♀).

A smooth and shining black species, with flavous markings. *Head* black, with the clypeus, mandibles, palpi, a genal mark, the inner orbits throughout but more broadly above, flavous. *Antennæ* immaculate. *Thorax* with the pronotum centrally, the radical callosities and the apices of the metapleuræ, flavous; all the pleuræ closely and strongly punctate; metanotum closely and strongly, though somewhat more coarsely, punctate. *Scutellum* flavous. *Abdomen* with the basal third of the first three segments, the apex of the third more narrowly, and the anus, flavous; terebra longer than half the body (5 millim.). *Legs* rufescent, with the anterior coxæ and trochanters flavescent; hind tibiæ and tarsi infuscate, with a rufescent tinge, and their bases white. *Wings* hyaline, with the radial and outer cubital cells apically infumate; tegulæ flavous and the stigma infuscate.

Length 8 millim.

Ceylon: Hatton (*E. E. Green*).

The figure (*loc. cit.*) shows that the vertical orbits are also pale; the notauli wanting; the abdomen very narrow discally to its centre and broadest shortly before its apex; the hind femora not slender; the radius curved towards its apex, but not above the distinctly sessile (*sic*) areolet; the nervellus appears to be emitted at, or but slightly above, the first recurrent of the hind wing, which is figured as postfurcal.

Tribe *XORIDIDES*.

This tribe follows the Cryptinæ, to which it is perhaps even more closely related than are the preceding, in natural sequence; in fact it is difficult to determine where one begins and the other terminates. Thus the more typical genera are very easily recognised by their cubical head, curiously reticulate exo-skeleton and entire lack of an areolet. But in *Echthrus* the areolet is pentagonal and entire, and the abdomen petiolate as in *Xylophrurus*;

Pseudeugalta might, perhaps, be placed in closer association with *Ephialtes*. Nor are the limits of the tribe well defined, since some doubt must still be entertained respecting the position of *Œdematopsis* and the allied genera, in spite of their elongate hypopygium. Their economy, however, is now proved to be related with the Lepidoptera, while that of the present group would appear to be confined to the lignivorous Coleoptera, and we must regard the records of Ratzeburg, and probably also of Giraud, to the contrary, with suspicion. Throughout the parasitic Hymenoptera it will be noted that the head is usually cubical in those genera (e. g. *Hecabolus*, *Histeromerus*, *Cheiropachus* and the present group), which prey upon lignivorous larvæ. With its wealth of forests, and the Longicorn * and Lamellicorn beetles preying upon their timber, India will prove very rich in *Xoridides*, though, unfortunately, none have yet been associated with specified hosts.

Table of Genera.

1	(8)	Areolet of the wing distinct and entire.	
2	(7)	Areolet broadly sessile and pentagonal.	
3	(4)	Front tibiæ neither intumescent nor basally constricted	AGENORA, Cam., p. 59.
4	(3)	Front tibiæ both intumescent and basally constricted.	
5	(6)	Clypeus apically dentate; metathoracic spiracles circular....	ECHTHRUS, Grav., p. 60.
6	(5)	Clypeus apically rounded; metathoracic spiracles linear	TORBDA, Cam., p. 61.
7	(2)	Areolet petiolate and triangular; clypeus not dentate	PSEUDEUGALTA, Ashm., p. 66.
8	(1)	Areolet of the wing entirely wanting.	
9	(10)	Tarsal claws bifid; clypeus not basally discreted	EUGALTA, Cam., p. 70.
10	(9)	Tarsal claws simple; clypeus basally discreted from face.	
11	(12)	Abdomen not impressed; metanotum simple	BATHYMERIS, Cam., p. 75.
12	(11)	Abdomen distinctly impressed; metanotal areæ entire	XYLONOMUS, Grav., p. 76.

* Mr. Gahan informs me that some six hundred and fifty species of this group of beetles have already been described, that about eight hundred will be known when the 'Fauna of India' is completed, but that he estimates that fully a thousand kinds inhabit India.

Genus AGENORA, *Cam.*

Agenora, Cameron, Journ. Bombay Nat. Hist. Soc. 1909, p. 722.

GENOTYPE, *A. hirticeps*, Cam.

Head cubical and densely pilose, with the temples broad and the occiput margined; vertex not transverse. Thorax densely pilose, with the notauli distinctly impressed and the mesopleuræ sulcate below; metanotum with strong areæ; basal area triangular; areola large, distinctly longer than broad, basally rounded and apically truncate; two large lateral areæ; spiracular areæ distinct and the petiolar entire, with a stout basal carina throughout. Abdominal petiole elongate and slender, cylindrical and not perceptibly explanate towards the centre, with subcentral spiracles. Legs with front tibiæ neither intumescent nor basally constricted, half the length of their tarsi; front calcaria large and broad, the posterior minute. Wings with the areolet large and pentagonal; basal nervure continuous through the median; and the nervellus intercepted shortly below its centre.

Range. N.W. India.

This genus, which I have not seen, is based upon male characters only and "would come in near *cabocephalus* [*Cubocephalus*], Ratz., which may be known from it by the transverse median nervure not being interstitial and by the less completely areolated metanotum," says Cameron (*loc. cit.*). I consider it extremely improbable, in view of the pentagonal areolet and slender basal segment, that it is correctly placed in the XORIDIDES, and I should certainly transpose it to the CRYPTINÆ, if I could do so from a personal knowledge of the insect.

22. Agenora hirticeps, *Cam.*

Agenora hirticeps, Cameron, *l. c.* p. 722 (♂).

A black and nitidulous species, with the head and thorax elongately white-pilose. *Head* with the basally broad and apically constricted mandibles, and the palpi, flavous. *Thorax* immaculate, and less than half the length of the abdomen. *Scutellum* large and somewhat, though not strongly, convex. *Abdomen* with recumbent white pilosity, densest on the apical segment; basal segment about half as long again as the second and covered with subelongate, erect, white pilosity. *Legs*: anterior pair fulvous, basally flavous; hind legs black, with their coxæ and femora red, their tibiæ basally curved and constricted. *Wings* hyaline, with the stigma and nervures black; tegulæ flavous.

Length 9 millim.

Captured by Lieut.-Col. Nurse in August, probably in the neighbourhood of Simla in 1898, but not now in his collection and unknown to me.

Genus **ECHTHRUS**, *Grav.*

Echthrus, Gravenhorst, Ichn. Eur. iii, 1829, p. 861.

Genotype, *Ichneumon reluctator*, L.

Head subcubical and rectangular; clypeus short and discrete, with an apical lamelliform projection; eyes oval and prominent. Antennæ normal or slender, filiform, usually white-banded and always with the apices of the slender flagellar joints subincrassate. Thorax cylindrical and not short; notauli distinct, mesosternal sulci entire; metathorax rugose, with the areæ more or less, and the petiolar area, entire; spiracles small and subcircular. Scutellum slightly convex, triangular and apically obtuse. Abdomen stout, elongate, subpetiolate and convex, nearly parallel-sided in ♂, shorter and oblong-ovate in ♀; basal segment narrower than the following and shallowly canaliculate, with the petiole stout and gradually constricted basally; postpetiole longer than broad, and in ♀ apically dilated, slightly longer and a little broader than the petiole; abdomen nearly smooth; terebra about as long as the abdomen or body, and emitted from a ventral fold. Legs not short; front tibiæ, especially in ♀, inflated and sharply constricted basally; fourth tarsal joint bilobed; claws simple. Wings somewhat ample and usually clouded; nervures strong, areolet large and pentagonal.

Range. North West Europe, Sikkim, United States, Canada, Vancouver, Japan.

Ratzeburg thought this genus hardly distinct from *Xorides*, but Taschenberg calls attention to the similarity of the antennal joints to those of *Cryptus* and of the shape of the thorax to that of *Ephialtes*. Thomson (Opusc. Ent. viii, p. 776) says that this genus forms a connecting link between the Cryptinæ and the present subfamily, from all the other genera of which, except *Torbda*, the pentagonal areolet, entire mesopleural sulci and petiolar area, inflated front tibiæ of ♀ and bilobed fourth tarsal joint, will distinguish it. His *Macrocryptus* (*Xylophrurus*, Först.) was erected for the reception of *E. lancifer*, Grav., which was placed among the Cryptinæ (*op. cit.* v, p. 486) on account of its hardly bordered petiole, the spiracles of which are further behind the centre (*cf.* Ichn. Brit. ii, p. 326, *et* iii, p. 3).

23. **Echthrus maculiscutis**, *Cam.*

Echthrus maculiscutis, Cameron, Tijds. Ent. 1907, p. 94 (♀).

A black species, with profuse citrinous markings. *Head* with the face, except a central mark, and the clypeus citrinous, somewhat strongly and sparsely punctate; labrum, a basal mandibular mark, palpi and nearly the whole of the orbits, citrinous; upper half of frons not very strongly, but closely and regularly, punctate. *Thorax* black, with the base of the prothorax, an irregular line at

the apex of the pronotum, the radical callosities, marks between both base and apex of the notauli, the mesopleuræ below and mesosternal marks, large curved marks on the metapleuræ and a trilobate one in the petiolar area, citrinous; mesonotum strongly and closely punctate, more closely between the notauli; metanotum very strongly punctate; pleuræ closely punctate, becoming stronger apically, with the propleuræ centrally striate. *Scutellum* not very closely punctate, broadly at its sides and apex, and the post-scutellum entirely citrinous. *Abdomen* closely punctate, strongly at the base, but more finely towards the anus; apices of the segments broadly citrinous and dilated laterally; venter, except basally, and the sides of the second and third segments broadly paler; terebra less than half the length of the body (5 millim.). *Legs*: anterior pairs flavous, with the tarsi and, to a less extent, their tibiæ infuscate above; hind femora and tibiæ fulvous, with the apices of both black, their tarsi and coxæ flavous, with a large black apical mark on the latter. *Wings* hyaline, with the stigma and nervures black; areolet small, longer than broad, centrally sinuate at the emission of the recurrent nervure; nervelet distinct; upper basal nervure emitted from the median behind the lower; first recurrent of the hind wings intercepted shortly above the centre.

Length 14 millim.

SIKKIM (*Col. C. T. Bingham*).

Genus TORBDA, *Cam.*

Torbda, Cameron, Entomologist, 1902, p. 18.

GENOTYPE, *T. geniculata*, Cam.

Head cubical, broadly developed behind the large and parallel eyes; occiput broadly incised and distinctly, though not sharply, margined; cheeks elongate; clypeus not distinctly discrete, apically not produced, but transverse and often obliquely deflexed; labrum elongately prominent; mandibles stout and apically bidentate. Antennæ stout and elongate, with the second and third joints of equal length. Thorax with the pronotum centrally tuberculate; notauli apically distinct; mesosternum indistinctly sulcate laterally in front; metathorax large and posteriorly rounded, with but a single basal transverse carina; spiracles linear and not elongate. Scutellum large, subdeplanate and apically rounded; its basal carinæ incrassate. Petiole stout and basally constricted, its spiracles nearly central; penultimate (*i. e.* 7th) segment strongly developed and nearly as long as the four preceding united; the apical distinctly longer laterally than the penultimate, with its apex deplanate and obviously discrete; terebra about half the length of the body. Legs both stout and elongate; tarsi densely spinose, with the front ones longer than their distinctly basally constricted tibiæ; claws simple; hind coxæ large

and about thrice as long as broad. Areolet pentagonal, large, longer than broad, slightly convergent above and angled at the reception of the second recurrent nervure; nervelet wanting; nervellus centrally intercepted.

Range. Assam.

The position of this genus rests entirely upon the situation of the petiolar spiracles, which was not very clearly described by its author; if they be central it is a Pimplid, if beyond the centre it is a Cryptid. In its cubical head, indistinctly sulcate mesosternum, elongate legs, constricted front tibiæ and simple claws it agrees with *Echthrus*, which is the only other genus in the PIMPLINÆ possessing a pentagonal areolet, but it is easily differentiated from that genus by the indistinctly discrete clypeus, which is not centrally produced, the tuberculate pronotum, linear metathoracic spiracles, stout antennæ, and especially by the abnormally developed penultimate abdominal segment. Its author remarks (*loc. cit.*):—"I am not quite certain as to the exact location of this genus. It has some affinity with the CRYPTINA. The position of the spiracles on the petiole separates it from the CRYPTINA. The very large hypopygium is somewhat as in ACÆNITINI, but it cannot be referred to any of the described genera in that group. The depressed clypeus in some of the species is similar to what it is in the XORIDINI, and they have some relationship to *Echthrus*. Probably the natural position of *Torbda* is with the *Xorides*. The species are very large and handsome—among the largest of the ICHNEUMONIDÆ." An examination of the types of all the known species enables me to place it close to *Nyxeophilus*, Först. (*nec* Thoms.), though it is not synonymous therewith.

Table of Species.

1	(8)	Black, with white markings; legs fulvous, with black and white markings.	
2	(7)	Postscutellum convex and not excavate; wings evenly infumate.	
3	(6)	Hind femora and tibiæ mainly fulvous.	
4	(5)	Scutellum apically white; hind legs marked with black	*geniculata*, Cam., [p. 63.
5	(4)	Scutellum mainly white; hind femora and tibiæ immaculate	*violaceipennis*, Cam., [p. 63.
6	(3)	Hind femora and tibiæ mainly black ..	*femorata*, Cam., [p. 63.
7	(2)	Postscutellum broadly excavate; wings fasciated	*maculipennis*, Cam., [p. 64.
8	(1)	Fulvous, with black markings; legs ferruginous, sometimes with sparse black markings.	
9	(10)	All segments with a basal black fascia; wings æneous......................	*fulgidipennis*, Cam., [p. 65.
10	(9)	Apical half of abdomen entirely black; wings fulvescent	*apicalis*, Cam., p. 65.

24. **Torbda geniculata**, *Cam.*

Torbda geniculata, Cameron,* Entom. 1902, p. 19 (♀).

Black; head, thorax, and abdomen marked with whitish; scutellum black, with its apex alone white; legs fulvous, with trochanters, apices of femora and of the hind tibiæ broadly black; coxæ white, black-marked; wings evenly subfulvescent hyaline throughout, with the nervures and stigma black.

Length 25 millim.; terebra 13 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

At once known by its large size, flavous segmental apices, with sides of the seventh segment concolorous, its mainly black body (in which it differs from the last two species), mainly black scutellum and black hind knees, by which it may be distinguished from all the following.

25. **Torbda violaceipennis**, *Cam.*

Torbda violaceipennis, Cameron,* Entom. 1902, p. 19 (♀).

Black; face, orbits, and scutellum broadly, and thorax marked with white; legs fulvous, with coxæ black, marked with white; wings evenly violescent throughout, with the nervures and stigma black.

Length 25 millim.; terebra 10 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Extremely like the above species and possibly a form of it, though differing in having the wings more strongly infumate, with the areolet narrower, the cubital nervure more strongly sinuate, the lower basal nervure but slightly antefurcal, the seventh segment subimmaculate, the hind femora and tibiæ paler and with no black markings, and the scutellum nearly entirely flavous.

26. **Torbda femorata**, *Cam.*

Torbda femorata, Cameron,* Entom. 1902, p. 19 (♂).

Black, broadly marked with white; legs fulvous, with coxæ and trochanters white; hind coxæ, femora and apical half of tibiæ black; hind tarsi white, basally black; wings evenly infuscate-hyaline throughout, with the nervures and stigma black.

Length 22 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

The only known male of this genus and very much more slender than any of the females, among which it might be

thought to represent the alternate sex of *T. geniculata*, with which the neuration exactly coincides, were it not that the hind

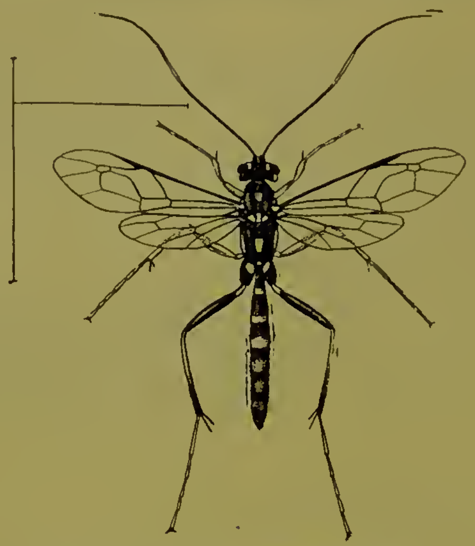

Fig. 13.—*Torbda femorata*, Cam.

femora are nearly entirely black and the abdomen entirely rufescent ochraceous from near base of the fourth segment, with the apices of the basal ones concolorous.

27. Torbda maculipennis, *Cam.*

Torbda maculipennis, Cameron,* Entom. 1902, p. 19 (♀).

Black; head, thorax, and abdomen marked with white; legs fulvous, with front coxæ white; posterior coxæ black, basally white; wings hyaline, with the stigma and nervures black; front wings with a fascia at base of the subdiscoidal nervure; areolet smaller than in the preceding species, and emitting the second recurrent nervure from its centre; cubital nervure roundly curved and not straight basally, oblique and parallel with the basal nervure.

Length 14 millim.; terebra 6–7 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

At once known from the following by its lack of fulvous coloration, and from all the foregoing by the entirely stramineous metathoracic apex and the remarkable infumescence at the base of the anal cell of the front wings, a position at which I have met with it in no other ICHNEUMONIDÆ; the legs are clear fulvous, with only the coxæ stramineous and black; the apices of the two basal segments are broadly, and of the remainder very narrowly, pale, and the pygidium is very large.

28. **Torbda fulgidipennis**, *Cam.* (Plate I, fig. 2.)

Torbda fulgidipennis, Cameron,* Entom. 1902, p. 19 (♀).

Ferruginous, with the thorax and abdomen marked with black clypeus distinctly discrete; basal half of petiole distinctly narrowed; petiole sharply marginate above and below; apical segment with a small triangular depression in its centre, whence an obscure sulcus runs obliquely down either side; abdominal segments lined with black at the base only; legs ferruginous, with the posterior coxæ marked with black. Wings fulvescent, with the stigma fulvous and the nervures black; recurrent nervure emitted from apical third of areolet; lower part of cubital nervure basally straight, oblique and parallel with the basal nervure.

Length 27 millim.; terebra 13 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

A magnificent dark fulvous species, with deep fulvescent wings, 45 millim. in expanse; the areolet twice as broad as long and emitting the recurrent nervure nearer its apex than in the preceding species; the apical half of the inner cubitus is distinctly sinuate and the basal metanotal trans-carina strong; the black apices of both the fulvous antennæ and terebra are conspicuous.

29. **Torbda apicalis**, *Cam.*

Torbda apicalis, Cameron,* Entom. 1902, p. 19 (♀).

Ferruginous; thoracic marks, apices of antennæ broadly, anus and terebra black; clypeus distinctly discrete; basal half of petiole distinctly narrowed; petiole sharply marginate above and below; third and following abdominal segments deep black; apical dorsal segment with an elongate longitudinal discal impression. Wings violaceo-hyaline, basally paler; stigma and nervures black; recurrent nervure emitted from apical third of stigma; lower part of cubital nervure basally straight, oblique and parallel with the basal nervure.

Length 18 millim.; terebra 11 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Remarkably similar to the last species, of which I should regard it as a variety were it not that the apophyses are distinctly prominent; in other respects it differs only in its smaller size, immaculate fulvous hind coxæ, the paler wings, the entirely black terebra and abdomen from base of third segment, the black stigma and hardly sinuate apical half of inner cubital cell.

Genus PSEUDEUGALTA, *Ashm.*

Pseudeugalta, Ashmead, Proc. U.S. Nat. Mus. xxiii, 1900, p. 55.
Baliena, Cameron, Manch. Mem. 1900, p. 101.

Genotype, *Eugalta spinosa*, Cam.

Eyes large and not apically convergent nor internally emarginate, upper orbits margined, nearly reaching base of the large apically truncate and unidentate mandibles; clypeus not separated from face; temples neither flat nor oblique; ocelli large and prominent. Prothorax not produced into a neck; mesonotum centrally reticulate at the apex, with the notauli deeply impressed; metathorax elongate and gradually rounded at the apex, irregularly trans-striate, with no areæ, but with a shallow central furrow on the basal three-fourths; spiracles subcentral, small, oval or almost circular. Abdomen smooth, with the segments not much broader than long; basal longer than second segment, gradually explanate towards its apex; gastrocœli of the second distinct; terebra elongate, longer than half the body, emitted from a ventral fold. Legs elongate and slender, with the coxæ large and elongate; hind tarsi nearly as long as their tibiæ, large, elongate, with their claws curved and more slender than the shorter and stout central lobes, which are wanting on the external hind claw only. Wings with an areolet; median nervure of hind wings entire to base.

Range. India, Philippine Islands.

This genus was split off by Ashmead from *Eugalta* for the reception of those species of the latter with the alar areolet entire, and no other points of distinction are claimed for it.*

Table of Species.

1 (4)	Thorax partly red; scutellum and hind femora black.	
2 (3)	Head posteriorly broad; areolet hardly petiolate	*spinosa*, Cam., p. 67.
3 (2)	Head posteriorly narrow; areolet petiolate	*moloch*, sp. n., p. 68.
4 (1)	Thorax not red-marked; scutellum pale; hind femora mainly fulvous.	
5 (6)	Mesonotum glabrous; hind tibiæ apically black	*nigricollis*, Cam., p. 69.
6 (5)	Mesonotum punctate; hind tibiæ apically white	*punctulata*, Cam., p. 69.

* To this genus belongs the Philippine *Pimpla furcifera*, Bingham (Ann. Nat. Hist. xvi, 1895, p. 445), as I am enabled to state from an examination of the typical ♂ in the British Museum. It is quite distinct from *Euxoides*, Cresson (Trans. Amer. Ent. Soc. 1870, p. 167, = *Calliclisis*, Först.), and may constitute the alternate sex of *Pseudeugalta punctulata*, Cam., though the central segments and scutellum are subglabrous, the mesonotum much more sparsely punctate and the hind femora are discally rayed with black, but without any black at the apex.

30. **Pseudeugalta spinosa**, *Cam.*

Eugalta spinosa, Cameron,* Manch. Mem. 1899, p. 139 (♀).

Head plumbeous black, with the face, inner orbits to ocelli, outer orbits at their lower two-thirds and the palpi, flavous; frons and vertex smooth, impunctate and subglabrous; postocular orbits red-marked; face and clypeus smooth, the former nitidulous and sparsely infuscate-pilose, the latter rufescent, with its apical two-thirds depressed, the apex laterally rounded and centrally broadly excavate; mandibles black, with the base red. *Antennæ* black, with a broad 12-jointed band beyond the centre white; scape black beneath, with fulvous pile; flagellum densely and obscurely pubescent. *Thorax* dark red, with most of the propleuræ, base of the mesonotum, the metanotum and the apical half of the metapleuræ, black; mesonotum closely punctate and densely infuscate-pilose, with the sides of the raised apical lobe irregularly striate and the depressed basal part transversely striate; propleuræ glabrous and nitidulous, punctate above; mesopleuræ closely, the callosities coarsely, punctate, the base strongly striate above and the apex centrally glabrous; mesosternum shining, with elongate white pilosity; metapleuræ rugosely punctate, becoming reticulate apically and beneath the radices. *Scutellum* and postscutellum punctate, the former with elongate infuscate pilosity and the latter apically subglabrous, with neither its base depressed nor sides margined; lateral scutellar foveæ strongly striolate. *Abdomen* black, with all the segmental apices and base of the petiole flavous; first segment basally rugose and apically smooth, with a curved, basally broad and apically acuminate spine near its base below; remaining segments closely punctate; terebra reflexed and a little longer than the abdomen, with the valvulæ densely and shortly black-pilose. *Legs* stramineous, with the anterior coxæ and femora black-lined; hind coxæ above, trochanterellus, femora and apical half of their tibiæ, black; hind calcaria and tarsi pure white, the two apical joints of the latter infuscate. *Wings* fulvescent hyaline; stigma and nervures black; areolet small and subpetiolate, emitting the recurrent nervure at its apical third.

Fig. 14.—*Pseudeugalta spinosa*, Cam.

Length 19 millim.

Assam: Khasi Hills (*Rothney*, type); Sikkim, iv. 91 (*Bingham*).

Type in the Oxford Museum.

This species "agrees closely in coloration with *Eugalta albitarsis*, but differs in having the median segment [metathorax] entirely black, in the complete areolet, in the base of the postscutellum being rounded, not depressed, and with the sides margined, in the median segment not being furrowed at the base, in the base of the petiole being broadly white, and in having on its underside, near the base, a curved sharp tooth" (Cameron, *loc. cit.*).

To the above description I will add that the head is buccate and posteriorly hardly narrower than the internally subparallel, and not at all emarginate, eyes; that the metanotum is evenly and strongly rugose throughout, with no trace of areæ, and apically produced on either side of the petiole, its spiracles being minute and distinctly oval; the hypopygium does not extend to the base of the terebra; the subpetiolar spine is reduced, in the ♀ I have examined, to little more than a tubercle (it is part of the ventral plication, and doubtless varies in desiccation); and the second recurrent nervure of the lower wings is very strongly postfurcal and intercepted at its upper fifth.

31. **Pseudeugalta moloch**, sp. n.

♀. A black and slender species, with the legs mainly ochraceous, prothorax flavous and wings apically infumate. *Head* unusually narrow and not bordered behind the internally entire eyes; face laterally glabrous and flavous, centrally strongly punctate and longitudinally subelevated; frons more narrowly flavous and very sparsely punctate; clypeus flavous and deplanate, centrally subimpressed and apically rounded; mandibles and cheeks flavous. *Antennæ* slender, nearly filiform and but slightly shorter than the body, rufescent throughout, with the very deeply excised scape flavous beneath and basally infuscate above. *Thorax* cylindrical and discally subdeplanate, black, with the prothorax, very short lines before tegulæ and two beneath each hind wing, flavous: mesonotum strongly punctate and dull, with but obsolete notauli; metathorax evenly punctate throughout to the apex, with no trace of areæ, the lateral carinæ only apically strong, and the spiracles transverse-linear. *Scutellum* black and nitidulous. *Abdomen* very slender, dull and shagreened, black, with the base of the segments indefinitely rufescent; basal half of the elongate and subnitidulous first segment ochraceous: terebra (11 millim.) a little longer than the apically subcompressed abdomen (9 millim.), with the valvulæ very slender and hardly pilose. *Legs* strongly elongate and dull flavous, with the hind femora, their coxæ (except basally), the apices (broadly) and extreme base (very narrowly) of the hind tibiæ, with their calcaria and the extreme base of their tarsi, black. *Wings* somewhat strongly flavescent, with the apices of the anterior pair definitely infumate; radius not arcuate above the elongately petiolate areolet; basal nervure continuous

through the median; nervellus postfurcal and intercepted at its centre.

Length 15 millim.

BURMA: Karen Hills, 3000–3700 ft. (*L. Fea*).

Type in the Genoa Museum.

Very like a small *P. spinosa* but differing therefrom in the narrower head, flagellar coloration, longer terebra, and infuscate wings, with straight radius above the petiolate areolet. Its coloration is very similar to that of *Eugalta linearis*. The alar infumescence is unique in the genus. I have seen only the type specimen.

32. Pseudeugalta nigricollis, *Cam.*

Eugalta nigricollis, Cameron,* Manch. Mem. 1899, p. 141 (♂).

Head black, with the obscurely punctate and shortly white-pilose face, and a triangular mark between the antennæ, flavous; clypeus and mandibles black, the former smooth and apically roundly curved. *Thorax* plumbeous black and immaculate; mesonotum glabrous and nitidulous, with the impressed base bearing four carinæ on either side; pro- and meso-pleuræ smooth and shining, impunctate and sparsely pale-pilose; metathorax closely and uniformly reticulate, with dense and elongate white pilosity; metapleuræ above strongly, and below closely, reticulate-punctate. *Scutellum* flavous and subrugulose, with dense and elongate white pilosity; postscutellum glabrous. *Abdomen* glabrous and shining, black, with the apices of all the segments narrowly, and base of the first broadly, stramineous. *Legs* stramineous, with the anterior coxæ partly black; hind legs fulvescent, with the apical half of their trochanters, of their femora and of their tibiæ, black. *Wings* hyaline, with the nervures of the basal part black and those of the apical, like the stigma, testaceous; areolet * oblique, shortly petiolate and emitting the recurrent nervure from its apical third; tegulæ flavous.

Length 15 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum; antennæ missing.

33. Pseudeugalta punctulata, *Cam.*

Eugalta punctulata, Cameron,* Manch. Mem. 1899, p. 142 (♀).
Baliena leptopus, Cameron,* *op. cit.* 1900, p. 102 (♀).

Head black, with the face and palpi flavous, and clypeus testaceous; face nitidulous, obsoletely punctate and elongately pale pilose, centrally prominent; clypeus with a broad elevated and semicircular basal border, centrally excavate; mandibles black and

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* Manch. Mem. 1899, p. 142, line 15, for "petiole" read "areolet."

basally piceous; frons impressed, with the inner orbits margined, the outer acutely elevated and obliquely strigose above. *Antennæ* black, with the scape beneath, and a 14-jointed central band, stramineous. *Thorax* black, with the callosities and an apical mesopleural line flavous; mesonotum strongly and closely punctate, propleuræ smooth and shining with the lower part flavous; mesopleuræ shagreened, closely and finely punctate near the radices; mesosternum impunctate; metathorax evenly scabriculous, with no indication of areæ above, laterally more closely, centrally coarsely sculptured. *Scutellum* strongly and closely punctate, with dense infuscate pilosity, white, with its base black; postscutellum black and subglabrous. *Abdomen* black, with the apices of all the segments narrowly, and base of the first broadly, stramineous; first segment smooth, with its centre obscurely shagreened; the two following closely and distinctly punctate, with the remainder subglabrous; gastrocœli obsolete, not deeply impressed, and closely punctate; basal ventral segment flavescent at both extremities, with a stout and centrally rounded basal tooth; terebra slightly longer than the abdomen. *Legs* flavous; the anterior with lines on the coxæ and whole of tarsi, except basal joint of front pair, black; hind legs black, with marks on coxæ and trochanters, the hind tarsi except the two apical joints, the apical third and the base of the tibiæ, white; and their femora, except at apex, fulvous. *Wings* hyaline and iridescent, with the costa and basal nervures black, the apical and the stigma infuscate; areolet small, oblique and subsessile, emitting the recurrent nervure from its apical third.

Length 12–19 millim. ♂ ♀.

ASSAM: Khasi Hills (*Rothney*, type); Chandkhira, Sylhet (*J. L. Sherwell*); SIKKIM (*Bingham*); TENASSERIM: Mergui (*W. Doherty*—Ind. Mus.).

Type in the Oxford Museum, also that of *B. leptopus*; they are unquestionably conspecific.

This female "comes nearer to *Eugalta nigricollis*, but is smaller, and has the mesonotum distinctly punctured; the clypeus semicircularly depressed at the apex; the petiole shorter; the second segment closely and rather strongly punctured; the hinder tibiæ black, broadly yellow at the base and apex" (Cameron, *loc. cit.*).

Genus **EUGALTA**, *Cam.*

Eugalta, Cameron, Manch. Mem. 1899, p. 135.

GENOTYPE, *E. strigosa*, Cam.

Eyes large and not apically convergent, upper orbits margined, nearly reaching the base of the large and unidentate mandibles: clypeus not discrete from the face; temples neither flat nor oblique; ocelli large and prominent. Prothorax not produced into a neck; mesonotum centrally reticulate at the apex, with the notauli deeply impressed; metathorax elongate and gradually rounded to its apex; spiracles subcentral, small, oval or almost

circular. Abdomen smooth, with the segments not much broader than long; basal longer than second segment, gradually dilated towards its apex; gastrocœli of the second segment distinct: terebra elongate, longer than half the body, emitted from a ventral fold. Legs long and slender, with the coxæ large and elongate; hind tarsi nearly as long as their tibiæ, large, elongate, with their claws curved and more slender than the shorter and stout central lobe. Wings with no areolet.

Range. Assam, Sikkim.

This genus originally included species both with and without an areolet, but Ashmead in 1900 erected a new genus, *Pseudeugalta*, for the reception of the former group, and although it is characterised by no other distinctions, it appears of sufficient importance to be accorded generic rank. Cameron says of his genus (*sensu lato*) that it "is nearly allied to *Rhyssa* [which has an areolet] and *Epirhyssa* [which has not], which differ from it in the transversely striated mesonotum, in the shorter metathorax, in the mandibles being bidentate, in the shorter petiole, which has the spiracles placed much nearer the base, and in the longer hinder tarsi, which are distinctly longer than the tibiæ." It is very closely allied to, and has much the facies of, the well-known European genus *Pœmenia*, Holmg., from which it mainly differs in its unidentate mandibles (*cf.* Zeits. Hym. Dipt. 1908, p. 174) and very curiously dentate tarsal claws, all of which are distinctly bidentate, apically and centrally, except the external hind one, where the central tooth is wanting and the apical more acutely angled.

Table of Species.

1 (2) Thorax mainly red; metanotum excavate	*strigosa*, Cam., p. 71.
2 (1) Thorax without red markings; metanotum not excavate.	
3 (4) Third and fourth segments black	*albitarsis*, Cam., p. 72.
4 (3) Third and fourth segments with pale bands.	
5 (6) Scutellum black; fifth abdominal segment normal	*linearis*, sp. n., p. 73.
6 (5) Scutellum flavous; fifth segment apically emarginate	*vittata*, sp. n., p 74.

34. **Eugalta strigosa**, *Cam.*

Eugalta strigosa, Cameron,* Manch. Mem. 1899, p. 136 (♀).

A beautiful black species, with the thorax red, the face and flagellar band and the legs mostly white. *Head* black, with the face and clypeus white, strongly punctate and sparsely clothed with elongate infuscate pilosity, the latter broadly impressed centrally and the palpi white; frons glabrous and subconcave; orbits acutely margined internally; vertex strongly punctate laterally above; occiput acutely margined above, centrally elevated

and closely punctate. *Antennæ* black, with the flagellum basally beneath, and centrally broadly, white. *Thorax* rufescent, elongate and thrice as long as the head, with infuscate discal and elongate white lateral pubescence; mesonotum closely punctate, with the bordering furrows crenulate and the lateral lobes strongly punctate; central lobe small, triangular and not constricted apically, stoutly reticulate to near its apex, where it is trans-strigose and circularly elevated; propleuræ glabrous, with the base punctate near the radices and purplish below; prosternum flavidous; mesopleuræ punctate, centrally glabrous and narrowly canaliculate, with a broad oblique furrow below the radices; metathorax large, irregularly transversely striate, with a longitudinal shallow furrow on the basal three-fourths; petiolar area pale flavous and with a transverse basal carina; metapleuræ rugosely punctate. *Scutellum* punctate and irregularly reticulate centrally, apically dull flavous, with its border margined on the lower side; postscutellum coarsely punctate, basally glabrous, oblique and rufescent, the remainder pale flavous. *Abdomen* black, with the extreme segmental apices white, broader centrally; first segment trans-strigose, more strongly so on the basal half, with the apical centrally canaliculate and laterally punctate at the apex; second segment with the gastrocœli glabrous and deeply impressed, strongly punctate, the third more finely so; the remainder shagreened and the third segment narrowly impressed laterally; terebra exactly as long as the body. *Legs* stramineous, with all the coxæ and femora black-marked; hind femora nearly entirely, their trochanters above, and tibiæ with fully the apical half, black; hind tarsi entirely, and nearly the basal half of their tibiæ, white. *Wings* hyaline, with a subfulvescent tinge, and the nervures and stigma black; the recurrent nervure is received about its length in front of the transverse cubital.

Length 20 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

35. **Eugalta albitarsis**, *Cam.*

Eugalta albitarsis, Cameron,* Manch. Mem. 1899, p. 138 (♀).

A black species, with a broad flagellar band, the tegulæ, coxæ, and tarsi white, and the hind legs partly red. *Head* black, with the face and palpi stramineous, and the apically rounded and centrally impressed clypeus piceous; frons and vertex subglabrous, nitidulous and plumbeous black; inner orbits distinctly margined above; face with elongate white, and clypeus with denser and longer pale fulvous, pilosity. *Antennæ* with the ninth to seventeenth joints white, and the scape beneath pale fulvous. *Thorax* black, with its lower edge white; mesonotum closely and rather strongly punctate, its base centrally depressed and trans-strigose; mesopleuræ closely punctate, with a longitudinal impression beneath the radices, a perpendicular central one, and a broader oblique one nearer the depressed and crenulate apex; metathorax

closely and evenly reticulate, with sparse and infuscate pilosity; metapleuræ closely reticulate, basally deeply canaliculate below. *Scutellum* and postscutellum closely punctate, the latter but slightly depressed basally, with the depression strongly striate laterally. *Abdomen* black, with the base and apex of the first, sides of the second apically, apex of the fifth and sixth narrowly, and of the seventh segment broadly, flavous; petiole trans-rugose, second segment strongly and closely punctate; second to fourth ventral segments testaceous; terebra 6 millim. *Legs* black, with the front coxæ anteriorly, and the anterior femora and tibiæ, white; intermediate coxæ white, except laterally at the apex; hind legs fulvous, with tibiæ and tarsi paler; their coxæ broadly in the centre, apical three-fourths of their femora and most of their tibiæ, base of the former and apex of their trochanters, black; apical tarsal joint infuscate. *Wings* hyaline and iridescent with the nervures and stigma black; radix and tegulæ white.

Length 11 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

36. **Eugalta linearis**, sp. n.

♂ ♀. A black and white species, with the scutellum immaculate and the femora alone rufescent. *Head* black, subcubical, and posteriorly as broad as the entire eyes; vertex broad and glabrous, with a few isolated punctures; occiput distinctly bordered above; palpi and face to above the antennæ flavous, latter obsoletely punctate; clypeus and the obsolete cheeks ferruginous, mandibles black. *Antennæ* filiform and slender, with the basal joints strongly elongate, black, with a ten-jointed central band and the scape beneath white. *Thorax* black, with the prothorax, a large callosity before and beneath the radix, and the entire apex of the mesopleuræ narrowly, white; mesonotum densely and irregularly punctate, metathorax evenly scabriculous, with no trace of areæ; spiracles oval and minute. *Scutellum* deplanate, nitidulous, sparsely and feebly punctate, entirely black. *Abdomen* sublinear and dull, with all the segments, with the exception of their flavous apices and the flavous base of the first, distinctly and finely punctate; basal segment centrally scabriculous; terebra straight, slightly longer than the body,

Fig. 15.—*Eugalta linearis*, Morl.

slender, with the valvulæ obsoletely pilose. *Legs* flavous, with the anterior coxæ and trochanters and most of their tarsi infuscate; hind coxæ and trochanters (except at base), apices of tibiæ and femora and tarsi, nigrescent; hind tibiæ sinuate before the base, the front ones with five ferruginous internal spines and a pectiniform row at the apex. *Wings* hyaline, with the radix and tegulæ white; costa and stigma piceous; radius hardly curved; areolet entirely wanting; second recurrent of lower wings very strongly postfurcal, emitting the nervellus from its upper fifth.

Length 13–14 millim.

This species is much smaller than the broadly red *E. strigosa* and has no metanotal impression; it is more closely allied to *S. albitarsis*, but all the abdominal segments are apically white, the petiole is not trans-rugose, only the apices of the hind femora are nigrescent, and the terebra is fully as long as the body. The abdomen of the ♂ is distinctly compressed.

SIKKIM (*Bingham*, type). ASSAM: Mahjain, Khasi Hills, 1000–3000 ft., v. 1905 (Pusa coll.).

Type in the British Museum.

The ♀ in the Pusa collection has the central mesonotal lobe laterally pale in front. A mutilated female in the National Collection, from the Northern Khasi Hills, has the terebra shorter than the abdomen, but I cannot satisfy myself that it is not broken.

37. **Eugalta vittata**, sp. n.

♀. A black and white species, with the scutellum entirely pale and the femora alone rufescent; terebra reflexed and distinctly longer than the body.

Length 15 millim.

This species is so closely allied to *E. linearis* as to need no detailed description; therefrom it may at once be known by its slightly larger and distinctly stouter conformation; the immaculate black scape; broadly white frontal orbits and two discal mesonotal vittæ; the evenly and closely punctate metathorax, which is not at all scabriculous; bright flavous scutellum and postscutellum; the broader stramineous apices of all the abdominal segments, of which the first is basally immaculate and the fifth apically strongly emarginate; the strongly reflexed terebra, which is fully a sixth longer than the whole body; the entirely immaculate trochanters and anterior coxæ; the hind coxæ black, with only the base broadly stramineous above, whereas in *E. linearis* they are stramineous with the upper side (except basally) black; by the extreme base of the hind tibiæ being abruptly black, and only the apical half of their last tarsal joint black; and by the radial nervure of the hind wing being distinctly shorter before the second recurrent.

From all other species of this genus it is instantly known by the much greater space between the reception by the median

nervure of the upper and lower basal nervures, which in this one only are not subcontinuous.

SIKKIM, iv. 91 (*Bingham*).

Type in the British Museum.

Genus BATHYMERIS, *Cam.*

Bathymeris, Cameron, Entomologist, 1906, p. 251.

GENOTYPE, *B. longipes*, Cam.

Head acutely dilated behind the internally parallel eyes; mandibles of unequal length; clypeus laterally bordered by a deeply impressed triangular sulcus and by a narrower one above, basally broadly impressed. Antennæ of normal length, with their apical joints subserrate and transverse. Metathorax elongate, of equal width and closely reticulate throughout. Abdomen with no transverse or oblique impressions; first segment elongate and basally half its apical breadth; second longer than broad; third quadrate and the remainder transverse; abdomen elongate, narrower than the thorax and apically attenuate. Legs long and slender. Wings with no areolet, the second recurrent of the fore wing partly pellucid, and the first of the hind wing intercepted far above the centre.

Range. Sikkim, Burma.

This genus is said by its author to be closely related to *Xorides*, but to differ therefrom in its parallel-sided face and unequal mandibles, which are apically edentate and obtusely rounded. It would also appear to approach *Xylonomus* in the facial conformation, but the height at which the nervellus intercepts will render it distinct. Of the European genera, *Pœmenia* appears to run very close and to be distinguished from *Bathymeris* by little but the length of the third and fourth segments.

38. Bathymeris longipes, *Cam.*

Bathymeris longipes, Cameron,* Entom. 1906, p. 251 (♀).

A black species with profuse flavous markings. *Head* black and glabrous, with the cheeks alone white-pilose; face flavous; the two basal ocelli as far from each other as from the eyes. *Antennæ* with the flagellum closely and obsoletely pilose, its basal joint distinctly shorter than the second. *Thorax* black, with a line on the lower part of the smooth and finely aciculate propleuræ, the large and strigose mesopleural callosities, and an elongate line beneath the hind radices, flavous; mesonotum closely and finely punctate, with the notauli and basal impression densely aciculate; metathorax more closely reticulate discally. *Scutellum* and postscutellum much more coarsely punctate than the mesonotum, immaculate. *Abdomen* black, with the base of the first

segment, and apices of the remainder more narrowly, flavous; the three basal segments, except at their apices, closely and finely punctate; terebra slightly longer than half the body (9 millim.). *Legs* pale flavous, with the hind femora fulvescent; hind legs with the apices of all the joints black; hind coxæ four times as

Fig. 16.—*Bathymeris longipes*, Cam.

long as broad and extending to the centre of the second segment. *Wings* hyaline, with the nervures and stigma black.

Length 17 millim.

SIKKIM (*Col. C. T. Bingham*, type). BURMA: Karen Hills, 3000-3700 ft., vi. 1888 (*L. Fea*—Genoa Mus.).

Type in the British Museum.

Genus XYLONOMUS, *Grav.*

Xylonomus, Gravenhorst, Ichn. Eur. iii, 1829, p. 819.

GENOTYPE, *Ichneumon præcatorius*, F.

Abdomen subsessile, deplanate and basally scabrous; areolet wanting; legs and terebra normal. Head short, subtransverse or subglobose, with the face quadrate and not narrowed towards the mouth; clypeus very short, subcircular, basally discrete, often strongly depressed, and remote from the orbiculate-oval and somewhat small eyes; genal costa inflexed towards the base of the peristomium; mandibles small, straight, subconical and triangular, apically subentire; palpi elongate, setaceous and pubescent, with the basal joint obconical and truncate, the second broader, cultriform and internally produced, the apical more slender and longer than the penultimate. Antennæ slender, usually white-banded and sometimes setiferous, stouter in ♀; scape and pedicellus of equal length and subglobose, the latter exserted and a little the

narrower ; annellus smooth and subobsolete ; flagellar joints cylindrical, gradually decreasing in length and apically hardly nodulose. Thorax cylindrical, much longer than high ; notauli distinct and elongate ; epomiæ and epicnemia distinct ; metanotal areæ and apophyses well defined ; spiracles oblong or linear. Scutellum more or less convex, triangular and apically obtuse. Abdomen subsessile, somewhat deplanate discally, finely punctate and rarely shining ; of ♂ elongate, sublinear or a little dilated towards the apex, narrower and usually twice as long as the thorax ; of ♀ shorter and as broad as the thorax, oblong or oblong-ovate. Basal segment longer than broad, scabriculous, usually with distinct longitudinal carinæ, parallel-sided or (in ♀) apically dilated, sometimes laterally impressed, with the spiracles slightly behind the centre ; eighth segment exserted in ♀. Terebra emitted before the apex, not or only slightly longer than the abdomen. Legs normal or subelongate ; anterior tibiæ, especially in ♀, incrassate and constricted at the base ; tarsal claws small and simple. Wings somewhat narrow ; areolet entirely wanting ; lower wings with the radial abscissa shorter than the recurrent nervure.

Range. Europe, Malay Archipelago, Japan, North America.

Cyanoxorides and *Spiloxorides*, Cam. (Jour. Str. Br. Roy. As. Soc. 1903, pp. 141 *et* 143) may be useful here as subgenera.

This genus differs from *Xorides* in the rugulose petiole and broader basal segment, as well as in its internally parallel eyes, which in the latter are subconvergent towards the apex ; its relationship with *Banchus* and *Arotes* is remarked upon by Gravenhorst. The species are few in number in Europe, though more numerous in America, and Smith has described several from the Malay Archipelago and Japan ; they are well known to prey beneficially on larvæ of Longicorn Coleoptera, which are often so destructive to forest and other trees.

Table of Species.

1 (4) Body mainly, and antennæ apically, black.	
2 (3) Thorax black ; frons punctate ; nervellus central..................	*tartarus*, sp. n., p. 78.
3 (2) Thorax apically pale ; frons glabrous : nervellus below centre	*abaddon*, sp. n., p. 79.
4 (1) Body strongly metallic and iridescent ; antennæ often apically white.	
5 (8) Antennæ broadly white at or before apices ; body not black.	
6 (7) Second recurrent nervure not continuous with submarginal........	*elizabethæ*, Bing., p. 80.
7 (6) Second recurrent nervure continuous with submarginal	*annulicornis*, Cam., p. 80.
8 (5) Antennæ narrowly white centrally ; body brilliant blue..............	*cærulescens*, sp. n., p. 81.

39. **Xylonomus tartarus**, sp. n.

♀. A large and somewhat dull black species, with the body immaculate, and the legs, antennæ and stigma white-marked. *Head* black, cubical and posteriorly not narrower than the internally parallel eyes; vertex very broad behind ocelli and, like the frons, scabrously punctate; face transverse, closely and transversely punctate; clypeus discrete and carinately elevated at the base, broadly rounded at the apex and centrally concave; mandibles slender and discally sulcate throughout, with their base hardly as broad as the inflexedly sulcate cheeks; palpi and sides of clypeus infuscate. *Antennæ* slender and pure black, with ninth to thirteenth flagellar joints white; subapical setæ distinct. *Thorax* immaculate black, discally deplanate, with the meta- hardly narrower than the mesothorax; mesonotum transversely scabriculous, with the notauli deeply impressed and not reaching the apical margin; metanotum nitidulous and coarsely coriaceous, with complete and strongly costate areæ; basal area elongate and parallel-sided; areola hexagonal-cordiform, large and situated beyond the centre, emitting costulæ before its centre; petiolar area small and subvertical, with very large and apically obtuse apophyses and small subapical spines; spiracles large and distinctly lunate. *Scutellum* deplanate, punctate, black. *Abdomen* narrow, subcylindrical and immaculate black; basal segment finely scabriculous, thrice as long as apically broad, gradually a little widened throughout, with the spiracles distinctly before the centre and with obsolete discal carinæ; second and third segments obsoletely scabriculous or alutaceous, longer than broad, with their basal angles obliquely impressed; remainder strongly transverse; ventral plica entire, hypopygium far retracted from the terebra and apically rounded; spicula exactly as long as the body, rufescent and incrassate before its apex, valvulæ black and not pilose. *Legs* black, with the base of all the tibiæ constricted and stramineous; femora and tibiæ broad and compressed; tarsi stramineous, with the onychii black and the central joints infuscate; claws very small and not extending beyond the elongate pulvilli. *Wings* narrow and hyaline; stigma and radix infuscate, former basally white; areolet wanting; hind wings with the first recurrent nervure but slightly postfurcal, emitting the strong nervellus from its exact centre.

Length 20–21 millim.

"India."

Type in the Oxford Museum.

The above description is drawn from two females, in all probability from Westwood's collection. The elongate form is similar to *Xorides*. In one example the internal nervure of the wanting areolet is curiously incrassate.

40. **Xylonomus abaddon**, sp. n.

♀. A dull black species, with the body profusely pale-marked and the stigma basally pure white. *Head* cubical and posteriorly not narrower than the internally parallel eyes; vertex very broad behind the ocelli and, like the frons, glabrous; face subtransverse, closely and superficially punctate; clypeus strongly transverse, discrete, basally carinately elevated, apically broadly rounded and centrally concave; mandibles slender and apically edentate, their base as broad as the length of the cheeks; frontal and external orbits, cheeks and whole face white. *Antennæ* slender, infuscate, with the ninth to thirteenth flagellar joints pure white, the basal ones stramineous and the scape entirely testaceous. *Thorax* black, with the propleuræ and prosternum entirely, the mesopleuræ broadly, the callosities before and beneath the radices, and the apical half of the metathorax (except below), testaceous; mesonotum distinctly and somewhat finely punctate, with strong and crenulate notauli; metanotum obsoletely punctate, basal area elongate and triangular; areola entire, pentagonal and longer than broad, emitting distinct costulæ from its centre; petiolar area broader than long, and entire, with apophyses strongly acuminate; spiracles elongate-oval; metapleuræ scabrous, with lateral carinæ distinct. *Scutellum* and postscutellum flavous, the former not convex, closely and obsoletely punctate, with its apex subtruncate. *Abdomen* hardly longer than the head and thorax, broadest behind the centre, black, with the apices of all the segments bright flavous and the basal half of the first testaceous; the three basal segments closely and alutaceously punctate, transversely impressed before their pale apices, the first with no discal carinæ, the second and third deeply sulcate laterally, as well as obliquely from the side of the apex to the centre of the base; terebra nearly as long as the abdomen, with the valvulæ red and apically black. *Legs* elongate and slender, fulvous, with the anterior pairs paler and their coxæ stramineous; front tibiæ basally sinuate; hind trochanters, extreme apices of their femora, and of their tibiæ more broadly, subinfuscate, their tarsi pure white, with the minute claws and onychii blackish. *Wings* clear hyaline, with the junction of the internal and external cubital nervures, and of the basal nervures, infumate; tegulæ black, radix pale, stigma and nervures piceous, with the base of the former pure white; median nervure not continuous through the basal; second recurrent strongly curved, narrowly bifenestrate and emitted from the external cubital distinctly beyond its junction with the internal; hind wings with the first recurrent but slightly postfurcal, emitting the strong nervellus from a little below its centre.

Length 12 millim.

ASSAM: Khasi Hills (*Col. Godwin-Austen*).

Type in the British Museum.

The typical female, and a second of the same sex taken with it, are the only specimens I have seen of this species.

41. **Xylonomus elizabethæ**, *Bing.* (Plate I, fig. 3.)

Xylonomus elizabethæ, Bingham, Journ. Bomb. Nat. Hist. Soc. 1898, p. 116, pl. A, figs. 5, 5 *a* (♀).

Head cubical, glabrous and nitidulous, dark blue or metallic green, with the internal orbits both above and more broadly below the antennæ, and the cheeks broadly, white. *Antennæ* filiform and black, with the tenth to sixteenth, and sometimes the four apical, flagellar joints white. *Thorax* rugose, metallic green and immaculate; mesonotum oval and elongate, with the notauli deeply impressed and extending to its base; metathorax apically rounded, shagreened, with four irregularly sinuate longitudinal carinæ, of which the inner pair extend to the apex and there terminate in a distinct red tooth on either side of the petiole; costulæ emitted beyond centre; basal area parallel-sided and apically open: spiracles linear. *Scutellum* immaculate. *Abdomen* dark shining blue or green, with the base and a diamond-shaped or transverse fascia on the first, a similar fascia on the second, and the extreme apical discal margins of the three or five following segments, clear flavous; eighth segment elongately exserted and brunneous; the basal segments subdeplanate, the apical subcompressed, and the second and third triangularly impressed discally; spicula black, with the valvulæ white-banded before their apices, hardly a third shorter than the body (13 millim.). *Legs* flavous, with the anterior pairs sometimes dark-marked; the hind pair with the apices of the coxæ subinfuscate, of the femora and tibiæ, with the claws and onychii, black; hind tarsi stramineous; anterior tibiæ basally sinuate and constricted. *Wings* hyaline, sometimes with an infumate cloud at the junction of the radial with the cubital cells; tegulæ and nervures testaceous.

Length 17 millim.

SIKKIM, 1000–4000 ft. (*Bingham*, type); ASSAM: Naga Hills (*Godwin-Austen*—Brit. Mus.); BURMA: Minhla (*Comotto*—Genoa Mus.).

Type. Location unknown.

Bingham's description of the coloration of the anterior legs is a little involved, but apparently all the joints in the typical form are more or less nigrescent at their apices; I have, however, seen the anterior legs immaculate testaceous.

42. **Xylonomus annulicornis**, *Cam.*

Epirhyssa annulicornis, Cameron, Manch. Mem. 1899, p. 133 (♀).

A cærulescent species with fulvous markings, the apical half of the flagellum white and the terebra shorter than the body. *Head* nitidulous and cæruleous, with the cheeks, frontal orbits and outer orbits below broadly, and the clypeus laterally (more narrowly below), flavous; face somewhat strongly punctate; clypeus subimpunctate, densely and elongately fulvous-pilose, centrally and

apically black, basally obliquely impressed; palpi pale testaceous; mandibles black and basally finely punctate, the apex with only one rounded tooth. *Antennæ* slender, densely and obsoletely black-pilose, with the scape testaceous beneath; a broad band beyond the centre and extending to the apices, except their last joint, white. Mesonotum closely punctate, with its basal three-fourths distinctly and irregularly reticulate and the lateral apical lobes centrally canaliculate; pro- and meso-pleuræ shagreened, the former glabrous and bicarinate below, the latter with dense fulvous pilosity and apically crenulately impressed; metanotum with its basal half shagreened and apical trans-strigose, its basal areæ coalescent, curved inwardly and narrowed; the petiolar area with the sides straight; the lateral carinæ evenly curved on the inner side of the spiracles, with the areæ on their inner side crenulate; metapleuræ longitudinally and irregularly strigose, shagreened above. *Scutellum* closely punctate, apically deplanate and carinate; postscutellum roundly impressed at the base and apex, and laterally stoutly carinate. *Abdomen* fulvous; basal segment distinctly longer than the second, flavescent, with a broad cærulescent central closely and coarsely punctate band, the apex more or less reticulate, centrally transversely strigose and tricarinate; second segment basally broadly blue and apically more narrowly black, its base centrally triangularly impressed and laterally with deep and oblique impressions, its apex broadly and obliquely depressed on either side; third segment broadly and semicircularly impressed near the base, with a central straight and narrow carina, and the sides obscurely strigose; first ventral segment basally black and substriate, with its apex and the centre of the two following segments testaceous; terebra not quite as long as the body. *Legs* fulvous, with the intermediate coxæ basally black; hind legs concolorous with coxæ except basally above and centrally beneath, trochanters, base and apex of tibiæ and of their cærulescent femora, black; hind tarsi, except their two black apical joints, white. *Wings* hyaline, basally white and slightly infumate below the apices; stigma black, basally white and internally infuscate.

Fig. 17.
Xylonomus annulicornis, Cam.

Length 17–19 millim.

ASSAM: Khasi Hills (*Rothney*); BURMA (*L. de Nicéville*—Brit. Mus.).

Type in the British Museum.

This species so closely resembles the preceding that it is only upon the distinct venation of the wings that I was finally enabled to satisfy myself of its right to specific rank; it differs also in having the hind coxæ entirely metallic green, with their tibiæ not or hardly apically infuscate, but their femora much more determinately black at the apex; the abdomen more distinctly carinate longitudinally in the centre, with the fourth and following segments (except at their apices), and the eighth entirely, green; the terebra as long as the body; the scutellum sometimes pale; and other minor details. But, whereas in *X. elizabethæ* the second recurrent nervure of the fore wings is emitted from the external cubital at an appreciable distance beyond that from which the submarginal (*i. e.* the inner nervure of the wanting areolet) rises, in *X. annulicornis* the second recurrent is directly continuous through the cubital to the submarginal nervure, which I consider a good and sufficient structural distinction for the erection of species.

43. **Xylonomus cærulescens**, sp. n.

♂ ♀. A large, immaculate and brilliantly metallic blue species, with the legs concolorous and the abdomen obliquely impressed. *Head* cubical and broad behind the internally parallel eyes; occiput bordered and the convex frons finely trans-aciculate on either side of the ocelli and cornute between the antennæ; face deplanate, rugulose and subelevated on either side; clypeus strongly discrete, subconcave and apically rounded throughout; mandibles stout, basally broad, apically obtuse, with no teeth but sinuate internally before their apices. *Antennæ* filiform; of ♂, strongly attenuate apically, as long as the body and immaculate; of ♀, with the eight apical joints incrassate, the sixth from apex obliquely truncate and emitting the fifth from its external apex only, the former also bearing three strong setæ at its apex, and one at its centre, externally; ♀ with flagellar joints 13 and 14 white. *Thorax* cylindrical, discally very strongly impressed; metanotum elongate, deplanate and shagreened, with the petiolar area short, glabrous and discreted; areola entire and sublinear, with no costulæ; lateral carinæ strong; apophyses prominent; spiracles linear. *Scutellum* deplanate, immarginate and apically impressed. *Abdomen* longer than the head and thorax, broadest beyond the centre, with the basal segment half its length, strongly bicarinate, very gradually widened throughout, and laterally emarginate beyond the centre; the three following segments deeply and obliquely impressed from near their apical angles to the centre of the base; valvulæ of ♂ not exserted; terebra longer than the body (25 millim.). *Legs* elongate, with the tibiæ not swollen, but the anterior pairs of ♀ internally sinuate basally; claws simple. *Wings* with no areolet and the base of the stigma conspicuously white, of ♂ entirely hyaline and of ♀ strongly

infumate throughout; nervellus very strongly geniculate, opposite, and intercepted below its centre.

Length 23 millim.

Ceylon: Ellahara, Anaradhapura (*O. S. Wickwar*).

Type in the author's collection.

Mr. O. S. Wickwar has kindly sent me a single pair of this beautiful species which he has recently captured.

Tribe *PIMPLIDES*.

The members of this tribe are at once known from the whole of the remainder of the Ichneumonidæ, including the other tribes of the Pimplinæ, by the more or less distinct tubercles visible on either side of each segment of the abdomen, rendering the surface, which is also generally transversely impressed before the apex, of very uneven appearance; in some cases each segment is deeply marked by a triangular impression with its base resting on the posterior margin and its apex in the centre of the anterior margin. The body, in the Oriental forms though not in the Palæarctic, is more often brightly rufescent, flavous, and even in a few cases metallic cyaneous, usually strongly punctate and often nitidulous. The earlier genera comprise some of the longest of known Ichneumons, though their form is so slender that in bulk they must yield to apparently smaller species. None of the species are small, and in the majority of cases the characters are sufficiently definite, though I have found it difficult to discriminate some genera with the requisite accuracy from the characters indicated by the authors who have described them; this defect has been to a considerable extent obviated, however, by an examination of Cameron's type specimens and others to which I have been so fortunate as to have had access. Seventeen genera have been recorded from India, and to these I have added five previously described from the Palæarctic and Nearctic regions, which, with three that I have found it necessary to bring forward as new, constitute a total of twenty-five, not all of which appear to me to be valid. This is but a tithe, probably, of those which await discovery, since this branch of the Parasitica appears to be well-nigh omnivorous, preying upon such diverse hosts as Diptera, Coleoptera, Arachnida, Hymenoptera, and in one or two cases the records of at least partially phytophagous species cannot yet be refuted. The ectoparasitic habits of some of the smaller kinds is of peculiar interest.

Table of Genera of Pimplides.

1 (32) Nervellus of hind wings intercepted at or above its centre (opposite or postfurcal).

2 (3) Nervellus intercepted exactly in its centre; head strongly buccate behind . Calliephialtes, [Ashm., p. 85.

3 (2) Nervellus intercepted distinctly above its centre; head normally transverse.

4 (15) Nervellus intercepted at or but slightly below its junction with the median nervure.

5 (10) Mesonotum trans-strigose; terebra always longer than body.

6 (7) Areolet of front wing wanting; body usually flavous .... EPIRHYSSA, Cress., [p. 87.

7 (6) Areolet of front wing entire; body usually black.

8 (9) Segments distinctly longer than broad; areolet subsessile .... RHYSSA, Grav., [p. 91.

9 (8) Segments hardly elongate; areolet elongately petiolate .... LYTARMES, Cam., [p. 94.

10 (5) Mesonotum not trans-strigose; terebra nearly always shorter than body.

11 (12) Face elongately produced; alar apices infumate .... ECHTHROMORPHA, [Holmg., p. 97.

12 (11) Face of normal length; wings immaculate.

13 (14) Hind femora simple beneath; apophyses obsolete .... HABROPIMPLA, [Cam., p. 104.

14 (13) Hind femora strongly dentate beneath; apophyses acuminate .... LISSOPIMPLA, Krch., [p. 106.

15 (4) Nervellus intercepted much nearer its centre.

16 (17) Scutellum with broad foliaceous border; labrum elongate .. .. XANTHOPIMPLA, [Sauss., p. 108.

17 (16) Scutellum not or narrowly bordered; labrum subconcealed.

18 (25) Abdomen glabrous, impunctate and, like thorax, profusely pale-marked.

19 (20) Femora incrassate, with anterior not canaliculate below .... THERONIA, Holmg., [p. 139.

20 (19) Femora not incrassate or with the anterior canaliculate below.

21 (22) Metanotum trans-striate, with no entire areæ .... LISSOTHERONIA, [Cam., p. 145.

22 (21) Metanotum subglabrous, with the areæ complete.

23 (24) Apophyses stout and obtuse; eyes internally deeply emarginate .... ORIENTOTHERONIA, [gen. nov., p. 146.

24 (23) Apophyses wanting; eyes internally obsoletely emarginate .... ERYTHROTHERONIA, [Cam., p. 149.

25 (18) Abdomen very distinctly punctate; body rarely profusely pale-marked.

26 (29) Clypeus not apically emarginate; abdominal tubercles obsolete.

27 (28) Metathoracic spiracles large and elongate; flagellum filiform .... PIMPLA, F., p. 151.

28 (27) Metathoracic spiracles small and circular; flagellum basally attenuate.... ITOPLECTIS, Först., [p. 169.

29 (26) Clypeus apically emarginate; abdominal tubercles distinct.

30 (31) Abdominal segments not elongate; terebra often shorter than body ...... EPIURUS, Först., [p. 172.

31 (30)	Abdominal segments elongate; terebra often longer than body.............	EPHIALTES, Schr.,
32 (1)	Nervellus of hind wing intercepted distinctly below its centre (antefurcal).	[p. 177.
33 (44)	Abdominal segments not triangularly impressed.	
34 (35)	Apical angles of segments acute and prominent; all wings with at least their apical margin deeply clouded ..	HEMIPIMPLA, Sauss.,
35 (34)	Apical angles of segments obtuse; at most apex of fore wing clouded.	[p. 186.
36 (41)	Areolet entire.	
37 (40)	Areolet not pentagonal.	
38 (39)	Eyes internally emarginate; face centrally carinate	[p. 194. PHILOPSYCHE, Cam.,
39 (38)	Eyes not emarginate; nor face centrally carinate	[p. 195. EXERISTES, Först.,
40 (37)	Areolet pentagonal	MIOPHATNUS, Cam.,
41 (36)	Areolet wanting.	[p. 204.
42 (43)	Notauli apical and superficial; wings entirely hyaline....................	POLYSPHINCTA,
43 (42)	Notauli deeply impressed and entire; wings infumately fasciated	[Grav., p. 205. CÆNOPIMPLA, Cam.,
44 (33)	Abdominal segments triangularly and deeply impressed.	[p. 208.
45 (46)	Areolet petiolate and entire	GLYPTOPIMPLA, gen.
46 (45)	Areolet entirely wanting.	[nov., p. 209.
47 (48)	Front tibiæ bicalcarate; abdomen normally punctate	GLYPTA, Grav.,
48 (47)	Front tibiæ unicalcarate; abdomen longitudinally striate	[p. 210. APOPHUA, gen. nov., [p. 213.

Genus CALLIEPHIALTES, *Ashm.*

Calliephialtes, Ashmead, Proc. U.S. Nat. Mus. xxiii, 1900, p. 54.

GENOTYPE, *Pimpla xanthothorax*, Ashm.

Head broadly buccate behind the eyes, which in ♂ are not distinctly emarginate internally. Third to fifth antennal joints not externally serrate. Mesonotum not transversely strigose; metathoracic spiracles small and quite circular. Abdomen subparallel-sided and not centrally explanate, with the anterior segments not more strongly sculptured than the posterior; second segment of ♀ longer than broad; terebra longer than the body. Hind tarsi of ♀ with the apical joint longer than the penultimate, and the claws strongly lobate basally. Wings with the nervelet wanting; and the first recurrent of lower wings intercepted in the centre.

Range. United States, Sikkim.

But a single species has hitherto been ascribed to this genus, *Pimpla xanthothorax*, Ashm. (Proc. U.S. Nat. Mus. 1890, p. 446), and that is described only in the female sex. It is, consequently,

with some hesitation that I here place a male, of whose female I am ignorant, and describe it as new, since Ashmead makes no mention, in 1900, of the very buccate temples, and his species is from Missouri, in America.

44. **Calliephialtes xanthosoma**, sp. n.

♂. A somewhat small flavous species, with black antennæ and markings. *Head* strongly buccate posteriorly and as broad as the eyes; flavidous, with a triangular central patch on the occiput, extending forward round the ocelli, and the apices of the mandibles, black; vertex broad and glabrous, scrobes ill-defined and large; face deplanate, entirely stramineous, nitidulous and shallowly punctate, apically truncately separated from the short flavous, centrally elevated and apically subtruncate clypeus; mandibles testaceous, somewhat stout, with the subequal teeth apically obtuse; palpi pale, cheeks obsolete. *Antennæ* nearly as long as the body, filiform, black, with the scape stramineous, and the flagellum basally ferruginous, beneath. *Thorax* flavous and strongly nitidulous, with a dot on the front of the mesonotum, a hamate mark on either side of it, a circular dot on the mesopleuræ, the apex of the nitidulous, exareolate and flavous-pilose metathorax, a dot at the apex of the scutellum, another before it, and the whole postscutellum black; metathorax entirely glabrous, with the spiracles quite circular and small. *Abdomen* flavous, with the apices of all the segments deep black, strongly and sparsely punctate throughout; basal segment bicarinate to the centre only; the five following broadly tuberculate on either side; valvulæ infuscate and hardly exserted. *Legs* flavidous and normal, with all the claws infuscate and not basally lobate; hind ones with the trochanters, extreme base and apex of their tibiæ, and the whole tarsi, infuscate. *Wings* normal and hyaline; radix and tegulæ flavous; costa and stigma, except the testaceous base of the latter, black; areolet broadly subtriangular, emitting the recurrent nervure from near its apex; first recurrent of hind wings a little postfurcal, emitting the nervellus from its exact centre.

Fig. 18.
Calliephialtes xanthosoma, Morl.

Length 8 millim.

SIKKIM (*Bingham*).

Type in the British Museum.

Described from a single specimen.

Genus EPIRHYSSA, *Cress.*

Epirhyssa, Cresson, Proc. Ent. Soc. Philad. 1865, p. 39.
Rhyssonota, Kriechbaumer, Ann. Nat. Hofmus. Wien, 1890, p. 489.

GENOTYPE, *E. speciosa*, Cress.

A genus of very large and strongly elongate species, with trans-striate mesonotum and the terebra longer than the whole body. Head short, subbuccate and transverse, usually dilated behind the oval and subreniform eyes; clypeus very short, strongly transverse and apically subproduced centrally, often basally discrete; mandibles stout and basally broad. Antennæ slender and filiform, not attenuate; flagellar joints elongate. Thorax subcylindrical and discally deplanate; mesonotum closely and regularly trans-strigose throughout, with the notauli entire and often deeply impressed; metanotum longitudinally canaliculate, with the spiracles oblong or ovate, and the areæ obsolete. Scutellum subconvex. Abdomen cylindrical, sessile, smooth and nitidulous, obsoletely alutaceous; ventral valvulæ of ♂ exserted; anus of ♀ subcompressed, third segment not basally impressed, eighth exserted and triangular, hypopygium not reaching base of terebra. Legs, and especially the hind ones, elongate, with tarsal claws simple and posterior coxæ subcylindrical. Wings ample, though not broad, with areolet entirely wanting; nervellus intercepting recurrent nervure close to its junction with the median vein.

Range. In America the genus has a wide distribution, from Brazil to Canada, and is also found in Cuba; but elsewhere, the representatives here enumerated, with a few from the Malay Region, are the only ones at present known from the Old World, with the exception of single Japanese and Annamese species.

This genus differs from *Rhyssa*, to which it is closely related in its strongly trans-striate mesonotum, in having the alar areolet entirely wanting.

Table of Species.

1 (2)	Abdomen and legs not black-marked	*flavobalteata*, Cam., [p. 88.
2 (1)	Abdomen and legs broadly black-marked.	
3 (4)	Frons carinate; scutellum punctate; abdomen mainly red..................	*carinifrons*, Cam., [p. 89.
4 (3)	Frons not carinate; scutellum striate.	
5 (6)	Abdomen flavous; scutellum apically black; all femora immaculate	*maculicornis*, Cam., [p. 89.
6 (5)	Abdomen fulvous; scutellum pale; all femora black-marked	*ornatipes*, Cam., [p. 90.

45. **Epirhyssa flavobalteata**, *Cam.*

Epirhyssa flavobalteata, Cameron,* Manch. Mem. 1899, p. 129 (♀).
Epirhyssa nigrobalteata, Cameron,* Journ. Str. Br. R. Asiatic Soc. 1903, p. 134; *cf.* Ann. Nat. Hist. xx, 1907, p. 16.

A fulvous species, with flavous markings, and the apices of the wings and antennæ nigrescent. *Head* fulvous, with the apical half of the frons and the whole of the closely punctate and white-pilose face flavous; vertex posteriorly rufescent; clypeus short, with its apex laterally rounded and the base trilobate, the central lobe being curved and the lateral ones smaller and much more deeply impressed; mandibles short and broad, with the apical half black and the basal rufescent; palpi stramineous. *Antennæ* dark red, nigrescent towards their apices, with the scape flavescent beneath. *Thorax* flavescent, with the mesonotum strongly striate, dark red, and its disc centrally black, its central lobe elevated, flavous-marked and apically perpendicular; propleuræ punctate with the basal half smooth and black; mesopleuræ apically black with two oblique nigrescent bands; mesosternum closely and strongly punctate; metanotum evenly rounded, with shallow and distinct punctures, centrally deeply canaliculate, basally black, shining, centrally broadly impressed and carinate on either side, with the apex black and subimpunctate; metapleuræ black and impressed at base and apex, carinate below the spiracles. *Scutellum* and postscutellum flavous; the latter basally bifoveate, the former transversely strigose and apically black. *Abdomen* dark red, with apices of all the segments broadly flavous; two basal segments feebly and isolatedly punctate, the central ones much more closely and strongly, and the remainder closely but less distinctly and densely infuscate-pilose; terebra distinctly a little longer than the body. *Legs* flavous, with the femora fulvescent and the hind coxæ darker; tarsi nigrescent. *Wings* fulvescent-hyaline, with the stigma testaceous red, the nervures infuscate and a subapical infumate fascia; fenestræ of second recurrent nervure large.

Fig. 19.
Epirhyssa flavobalteata, Cam.

Length 13–22 millim.

Assam: Khasi Hills (*Rothney*, type). Malay States: Perak (*Dr. Hanitsch*). Borneo.

Type in the British Museum.

The type is a discoloured spirit specimen, and the description of *E. nigrobalteata* is the more typical.

Both the size and the extent of the black and flavous coloration of this female are said to vary to no inconsiderable extent. A female of the maximum size, taken by Dr. Hanitsch at Maxwell's Hill, Perak, during August 1908, has the abdomen broadly black-marked; it may belong to a different species.

46. **Epirhyssa carinifrons**, *Cam.*

Epirhyssa carinifrons, Cameron,* Manch. Mem. 1899, p. 131 (♂).

A black and profusely red and flavous marked species, with the abdomen black-banded and the frons longitudinally carinate. *Head* black, with the palpi, the coarsely punctate and white-pilose face, the impressed and centrally carinate frons (except centrally), part of the posteriorly rounded occiput, and the orbits flavous; clypeus nude, glabrous and apically transverse; mandibles basally red. *Antennæ* red, becoming infuscate and incrassate towards their apices; flagellum densely and obsoletely pubescent. *Thorax* black, with a broad post-central metanotal band extending nearly to the spiracles, the propleuræ broadly above, and the prosternum pale flavous; mesonotum with infuscate pilosity; propleuræ, except above, impunctate; mesopleuræ sparsely punctate, except apically, with the callosities large, densely and elongately white-pilose; mesosternum coarsely punctate and smoother apically in the centre; metanotum shallowly punctate and sparsely white-pilose, its base smooth, with a broad and deep central impression. *Scutellum*, as well as its carinæ and the postscutellum, pale flavous, the former coarsely punctate and elongately infuscate-pilose, the latter glabrous. *Abdomen* dark red, closely punctate and, especially towards the brunneous anus, shortly infuscate-pilose; apices of the four basal segments flavescent and, except the first, broadly black at the base; petiole smooth. *Legs* fulvous, with their bases paler and the tarsi infuscate; anterior legs flavescent; hind coxæ black, with their apices broadly flavous centrally and their femora dark fulvous. *Wings* hyaline and obsoletely fulvescent, with an infumate mark at the apex extending to near the radial cell; costa and stigma testaceous red, nervures darker towards the radices.

Length 11 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum; the abdomen is lost.

47. **Epirhyssa maculicornis**, *Cam.* (Plate I, fig. 4.)

Epirhyssa maculicornis, Cameron,* Manch. Mem. 1899, p. 132 (♀).

A handsome flavous species, with black but no fulvous markings, and the wings apically clouded. *Head* flavous, with the occiput centrally, vertex transversely, and the closely but feebly punctate frons quadrately, black; clypeus laterally glabrous and centrally

trans-strigose; mandibles and the basally aciculate cheeks black. *Antennæ* black, ferruginous and slightly incrassate towards their apices, with the flagellum piceous beneath at the base. *Thorax* flavous; mesonotum, excepting for marks at radices and a large, elongate and laterally parallel-sided vitta on the disc, black; the transverse striations stronger and more widely separated laterally than discally; pro- and meso-pleuræ glabrous and nitidulous, with the latter broadly at the base and more narrowly below at the apex, black; mesosternum with a transverse series of infuscate lines on either side; metathorax narrowly black basally, centrally smooth and broadly canaliculate, laterally closely punctate, with a broad semicircular apical black band; metapleuræ obscurely punctate in the centre with the base and apex black-lined. *Scutellum* finely and closely trans-strigose, flavous, with its extreme apex centrally, like the glabrous and nitidulous postscutellum, black. *Abdomen* nitidulous, flavous, with all the segments narrowly black at the base and more broadly so at the apex, punctate, with their apices glabrous; apical ones also longitudinally black centrally; terebra one-fourth longer than the body. *Legs* flavous, with the apices of the hind coxæ, their tibiæ basally and all the tarsi apically, black. *Wings* hyaline, with their apices infumate; costa, stigma and nervures black; the second recurrent nervure broadly fenestrate; upper basal intercepting the median nervure of the fore wings distinctly beyond the lower basal nervure.

Length 15 millim.

ASSAM: Khasi Hills (*Rothney*, type). SIKKIM (*Bingham*, var., Brit. Mus.).

Type in the Oxford Museum.

I have seen two females of this species differing slightly from the above description in having the metanotum glabrous and nitidulous, throughout with no trace of areæ, the mesonotum laterally flavous throughout, the mesosternum entirely black and the pleuræ obliquely black in the centre, and the hind coxæ and tibiæ immaculate flavous. The intermediate coxæ are internally black-marked; the mandibles short and obliquely unidentate apically; the metathoracic spiracles elongate-oval and very small; the basal segment shorter than the second; the nervellus intercepting the first recurrent of the lower wing at its junction with the median; and the terebral valvulæ are distinctly incrassate apically.

48. Epirhyssa ornatipes, *Cam.*

Epirhyssa ornatipes, Cameron, Spolia Zeylanica, 1905, p. 132 (♂).

A pale fulvous species, with black markings. *Head* glabrous and nitidulous, with short white pubescence; frons centrally, the occiput, the ocellar region, an extension from it laterally to the orbits, the mandibles and their basal region, black. *Antennæ* immaculate black. *Thorax* shining and smooth; the trans-striate mesonotum nitidulous black, with a large central fulvous

mark, which is longer than broad, of equal width throughout, and transverse at both base and apex; metanotum fulvous, with a narrow line on its base, a large and somewhat triangular mark on its apical half and an apical line, black; pleuræ fulvous, with short white pubescence, the propleuræ with a conical mark below, and the metapleuræ below, and at apex, black. *Scutellum* entirely fulvous and finely trans-striate; postscutellum black. *Abdomen* fulvous, with discal bands at base and apex of all the segments nitidulous black, those on the penultimate segments discally continuous. *Legs* fulvous, with a broad discal band slightly behind the centre of all the femora and a shorter basal line on the hind ones, the posterior tarsi entirely and their trochanters basally, the hind tibiæ broadly at both base and apex, and the front onychii, black. *Wings* hyaline, with their apices distinctly infumate; nervures and stigma black.

Length 10 millim.

Ceylon; Hantane (*E. E. Green*).

This species is much smaller than *E. maculicornis*, of which it may, nevertheless, constitute the alternate sex, though its colour is described as of a much darker yellow and the black markings are slightly more profuse, especially upon the legs; unfortunately the structure of the metathorax is not yet indicated.

Genus RHYSSA, *Grav.*

Rhyssa, Gravenhorst, Ichn. Eur. iii, 1829, p. 260.

Genotype, *Ichneumon persuasoria*, L.

A genus of very large and strongly elongate species with trans-striate mesonotum and terebra longer than the body. Head short, subbuccate and transverse, usually dilated behind the oval or subreniform eyes; clypeus very short, strongly transverse and generally a little produced centrally at the apex, often indistinctly separated basally; mandibles basally broad. Antennæ filiform, not attenuate apically, with the flagellar joints elongate. Thorax subcylindrical, discally deplanate; pronotum centrally glabrous; mesonotum closely and regularly trans-striate throughout, with notauli entire and often deeply impressed; metanotum longitudinally canaliculate, with the areola rarely indicated; spiracles oblong or oval. Scutellum subconvex and apically obtuse. Abdomen cylindrical, sessile, smooth and shining, glabrous or obsoletely alutaceous; ♂ with the ventral valvulæ exserted; ♀ with the anus subcompressed, the third segment not basally impressed, the eighth exserted and subtriangular, the apical ventral not reaching the base of the terebra, which is longer than the body, with the sheaths not pilose. Legs, especially the hind pair, elongate; tarsal claws simple; posterior coxæ subcylindrical. Wings ample, though not broad, with the areolet entire, triangular, sessile or subpetiolate; nervellus intercepting the first recurrent of lower wings very near its junction with the median nervure.

Range. Palæarctic and Nearctic Regions.

This very distinct genus may be known by the transversely rugose thorax, somewhat relating it to the Xoridides, between which and *Coleocentrus* it would appear, as is pointed out by Thomson (Opusc. Ent. p. 737), to form a transitional group of species. Its European representatives are very well known to prey upon the large wood wasps, of the family Siricidæ, and doubtless their Indian relations follow a similar means of livelihood; in fact, Mr. E. P. Stebbing tells us (Journ. Bombay Nat. Hist. Soc. xvi, p. 684) that both *Thalessa* and *Rhyssa* attack wood-feeding grubs in India, though I have seen and heard of no representatives of the former genus thence. He does not, however, state that these grubs are the larvæ of *Sirex*, but I have seen females of the latter, differing from the Palæarctic *Sirex gigas*, L., only in having the prothorax ferruginous and the hind tibiæ partly black, in the collection of Mr. Ernest Elliott, from Haidarabad, in Berar; and three kinds of *Xiphydria* have already been found in India (*cf.* Spolia Zeylanica, 1905, p. 71). The Linnean *Sirex* has been noticed by Radoszkovsky (Horæ Ent. viii, p. 200) as far east as the Caspian Sea; and the genus is known to be very widely distributed.

49. Rhyssa persuasoria, *L.*

Ichneumon persuasorius, Linnæus, Faun. Suec. p. 400; Donovan, Brit. Ins. xv, p. 522 (♀).
Pimpla persuasoria, Fabricius, Syst. Piez. 1804, p. 112.
Rhyssa persuasoria, Gravenhorst, Ichn. Eur. iii, 1829, p. 267; Holmgren, Sv. Ak. Handl. 1860, no. 10, p. 9; Taschenberg, Zeit. Ges. Nat. 1863, p. 251; Vollenhoven, Pinac. pl. xi, figs. 5, 6 (♂ ♀).

Head laterally intumescent and as broad as the eyes, frons and face subglabrous; epistoma deplanate, clypeus narrow and centrally obtusely produced; palpi and all the orbits more or less white, though sometimes immaculate on the vertex; ♂ with the face also entirely white. *Antennæ* filiform, shorter than body, scape black; flagellum generally dull ferruginous beneath or even entirely, with the joints elongate, apically nodulose and the basal one distinctly curved. *Thorax* subcylindrical, black; metanotum centrally canaliculate; propleural marks, pronotum broadly in front, a line before and a callosity beneath radix, a mark above the intermediate coxæ and another above the hind ones, which latter sometimes coalesce across the apex of the metathorax, white. *Scutellum* and postscutellum entirely or apically white; very rarely black. *Abdomen* quite twice as long as head and thorax, cylindrical and about as broad as the latter, in ♀ laterally subcompressed; basal segment gradually constricted, of ♂ thrice as long as broad, glabrous and centrally sulcate; one or two basal segments apically, and laterally towards the apex, white; second or third to seventh with lateral and infra-apical spots on either side more or less broadly white; terebra nearly a

quarter as long again as the body. *Legs* elongate and somewhat slender, fulvous; coxæ sometimes badious, or rarely in ♂ black, front ones of ♀ very rarely nearly totally black, the anterior pairs

Fig. 20.—*Rhyssa persuasoria* L.

of both sexes generally whitish beneath; hind tarsi and tibiæ infuscate or rarely dull ferruginous. *Wings* narrow and flavescent, with the stigma blackish; radix and tegulæ white; areolet irregularly triangular, sessile or subpetiolate; first recurrent of lower wings strongly postfurcal and intercepted far above its centre. *Length* 22–34 millim.

A common Palæarctic species occurring throughout the north temperate zone; I have seen it from the United States, Canada, from Yesso, in the north of Japan, and from spruce woods at Deota, Tehri-Gashial, in the North-west Himalayas at an altitude of 7000 feet, in June 1902 (*E. P. Stebbing*).

50. Rhyssa fulvipennis, *Cam.*

Rhyssa fulvipennis, Cameron,* Manch. Mem. 1899, p. 127 (♀).

A large black and flavous species, with the antennæ and legs fulvous, and the wings somewhat clouded. *Head* fulvous, with the face flavescent; frons, apex of vertex, occiput above, a central line between them, mandibles and apex of face, black; face glabrous, with sparse and infuscate pilosity, epistoma feebly punctate; frons and vertex subglabrous, with isolated punctures. *Antennæ* pale fulvous and centrally subflavescent; scape nitidulous and subglabrous. *Thorax* black, with the propleuræ smooth, shining and broadly fulvous above; mesonotum sparsely pilose, with two anteriorly coalesced vittæ on its central lobe, a central line, and shorter ones above the radices, fulvous; mesopleuræ finely punctate and apically crenulate, with the callosities and a large basal mark pale fulvous; metathorax glabrous and nitidulous, with the areola large, deeply impressed, transverse and laterally

carinate. *Scutellum* broadly in the centre and the postscutellum (except centrally) fulvescent, the former finely and transversely punctate. *Abdomen* nitidulous and dark red, with the petiole paler; second segment with two broad and obscure fulvous discal lines; remainder with concolorous lateral lines, basally broad and apically obliquely constricted; venter flavescent, with the basal segment flavous; terebra 65 millim. in length with the valvulæ dull fulvous towards their apices. *Legs* red, with the anterior coxæ and trochanters flavous; hind coxæ dark red and basally marked with black and flavous, their tarsi subflavescent. *Wings* deeply fulvescent-hyaline, with their apices hardy infumate; costa and stigma fulvous, nervures black; areolet triangular, emitting the recurrent nervure from its apical fourth; internal nervure of areolet oblique and straight, the external curved.

Length 38–39 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

This species is quite distinct from the cosmopolitan *R. persuasoria*, L., which has no fulvescent markings on the body, but is banded or laterally spotted with stramineous.

Genus LYTARMES, *Cam.*

Lytarmes, Cameron, Manch. Mem. 1899, p. 144.

Genotype, *L. maculipennis*, Cam.

Head not strongly buccate posteriorly; clypeus basally separated from the face and laterally depressed at the base; mandibles short, stout and apically bidentate. Meta- shorter than meso-thorax; mesonotum trans-strigose, with the notauli anteriorly deeply impressed; metanotum gradually declivous throughout and triangularly impressed basally; spiracles large, elongate and rounded at both extremities. Scutellum deplanate and pale. Abdomen glabrous and not impressed; basal segment shorter than the second, with the spiracles oval, oblique and approximate to the base; intermediate segments not longer than broad, aciculate and apically neither emarginate nor incised; of ♂ strongly convex discally; terebra longer than body. Legs stout; hind coxæ parallel-sided and not inflated; tarsi spinose, with the claws simple, hind ones as long as their tibiæ, with the last joint about thrice the length of the penultimate. Areolet rounded above, as long as or but slightly longer than its petiole, and emitting the recurrent nervure a little before its centre; upper basal nervure emitted from the median nervure distinctly before the lower; radial cell somewhat narrow, and lanceolate at both extremities; lower wing with the first recurrent postfurcal, emitting the nervellus from its junction with the median nervure. The sexes differ only in the form of the abdomen.

Range. Assam, Tenasserim.

"This genus has the striated mesonotum of *Rhyssa*, but differs from it in the appendiculated areolet and in the abdominal

segments being not distinctly longer than their breadth, in the shorter hinder tarsi compared with the tibiæ, in the much shorter hinder coxæ, and in the head being less developed behind the eyes" (*Cameron*, loc. cit.).

Table of Species.

1 (2) Wings infumate below stigma; mesonotum not flavous .... *maculipennis*, Cam.
2 (1) Wings hyaline; mesonotum with discal flavous stripes .... *hyalinipennis*, Cam.

51. Lytarmes maculipennis, *Cam.*

Lytarmes maculipennis, Cameron,* Manch. Mem. 1899, p. 145, pl. iii, fig. 9 (♀).

A black species, with brown markings and the legs paler, the head white-marked and the wings infumate below the stigma. *Head* with the face (except centrally), clypeus, frontal orbits broadly throughout and the outer (except on the vertex), flavous; face centrally infuscate; mandibles black and palpi flavescent; face punctate and densely covered with elongate infuscate pilosity; frons black, nitidulous and trans-aciculate, with the orbits elevated; vertex posteriorly, and the occiput, piceous. *Antennæ* slightly shorter than the body, with the flagellum blackish and basally ferruginous; scape flavescent below and rufescent above. *Thorax* brownish, with black markings: pronotum broadly, and the callosities at the radices, stramineous; mesonotum with three broad discal stripes and the scutellar fovea black; pleuræ glabrous and nitidulous, with the mesopleuræ roundly elevated below; mesosternum shagreened, with dense and infuscate pilosity; metathorax smooth and shining, ferruginous, with its centre stramineous, apex black and its base triangularly impressed. *Scutellum* except at apex, and its carinæ, stramineous and punctate; postscutellum glabrous and nitidulous, broadly impressed centrally and rounded apically. *Abdomen* black and glabrous,

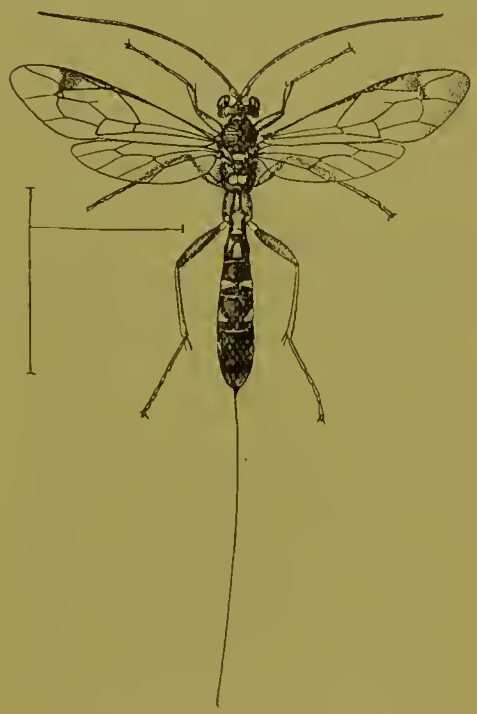

Fig. 21.—*Lytarmes maculipennis*, Cam.

with the third to sixth segments shagreened; petiole red to beyond its centre; apical margin of first segment, a basally triangular and apically transverse mark on disc of second, and internally constricted lateral marks on the three following segments, stramineous; apical segment triangular, deplanate, smooth and shining; anus densely fulvous-pilose; terebra about one-third longer than the body. *Legs* with the anterior coxæ, trochanters and the front of their tibiæ stramineous; hind legs with the basal half of the tibiæ and the whole of the tarsi infuscate, coxæ ferruginous with black markings and an apical spot above, like the base of their trochanters, flavous. *Wings* fulvescent-hyaline, with an infumate fascia from the apex of the stigma to the areolet, "the pedicle of the latter is about two-thirds of the length of the basal branch of the transverse cubital nervure; the apical branch is bullated on the lower side"; areolet emitting the centrally broadly bifenestrate recurrent nervure nearly from its centre.

Length 16 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

52. **Lytarmes hyalinipennis**, *Cam.*

Lytarmes hyalinipennis, Cameron,* Manch. Mem. 1899, p. 146 (♂).

Head stramineous, with the ocellar region and the centre of the apically subtransaciculate frons black, and the vertex posteriorly, with the occiput, piceous; mouth ferruginous, with the mandibles black and palpi flavous; face punctate and clypeus glabrous. *Antennæ* rufescent, with the obsoletely pubescent flagellum apically darker and basally, like the scape, flavescent. *Thorax* piceous; propleuræ black, flavous above; mesonotum with two flavous discal stripes, the scutellar fovea and a triangular impression before it black; mesopleuræ smooth and shining, black, with a large flavous mark beneath the flavous callosities; mesosternum rufescent, with an oblique basal black mark; metathorax smooth, nitidulous, sparsely infuscate-pilose and flavous; black in the spiracular region, at the apex and at the triangularly impressed base; metapleuræ flavescent, with their base, apex and lower sides black. *Scutellum*, postscutellum and its carinæ stramineous, the former punctate, with long white pilosity and apically piceous; the latter glabrous and nitidulous. *Abdomen* black, with the apices of the third to fifth segments broadly, of the second narrowly, the two basal longitudinally on the disc and the base of the first, flavous; anus ferruginous; ventral segments, except the apical, testaceous; terebra (18 millim.) longer than the body. *Legs*: anterior pairs fulvous, with the coxæ and trochanters flavescent; hind legs red, the coxæ flavous and broadly black-marked on either side, their trochanters basally flavescent, their tibiæ and the posterior tarsi blackish, with

dense and short pale pilosity. *Wings* hyaline throughout, with the stigma testaceous and the nervures darker; apical abscissa of radius basally curved, the basal straight and double the length of the areolar petiole.

Length, ♂ 12 millim.; ♀ 16 millim.

ASSAM: Khasi Hills (*Rothney*, type); TENASSERIM (*Doherty*—Ind. Mus.).

Type in the Oxford Museum.

No remark is made by its author upon the possibility of any sexual relation between this species and the last; the distinctions between them appear to consist principally of colour, and it is strange that two so closely related insects, from the same district, should have been at first known only in opposite sexes.

A single pair in the Indian Museum, from Tenasserim, has passed through my hands; both sexes agree with Cameron's somewhat superficial description, given above, in every respect, with the exception of the relative length of the basal radial abscissa and areolar petiole, which is not more than one-fourth or one-fifth of the length of the former; the scutellum is peculiarly broad and dull, the metanotum polished and strongly nitidulous, with its spiracles elongate and impressed; the abdomen is sublinear and shining, with the third and fourth segments strongly emarginate apically; the hind tibiæ are unusually stout, basally blackish, and the front ones are basally constricted.

Genus **ECHTHROMORPHA**, *Holmg.*

Echthromorpha, Holmgren (*nec* Tschek), Sv. Ak. Handl. 1868, p. 406.

Chrysopimpla, Cameron, Manch. Mem. 1899, p. 185.

GENOTYPE, *Cryptus intricatorius*, F.

Head narrow and not at all dilated behind; face elongate and broadly developed below the eyes; clypeus narrowly discrete basally and broadly rounded apically, hardly shorter than the face; labrum strongly exserted; upper mandibular tooth the longer; eyes prominent, internally strongly emarginate, subconvergent apically, leaving the cheeks broad. Antennæ not pale-banded, but elongate and filiform, with the basal flagellar joints elongate, and, in ♂, very strongly nodose at the base and apex; scape externally excised throughout. Metathorax with no trace of areæ, basally punctate, with elongate and very large spiracles. Scutellum and postscutellum distinctly convex. Basal abdominal segment as long as the second and not strongly impressed basally; central segments obliquely incised in their basal angles, with the lateral tubercles obsolete; terebra shorter than the abdomen. Legs somewhat stout, with the front tibiæ half the length of their basally incised tarsi; claws large and strongly curved, though neither pectinate nor basally lobate; hind femora simple and centrally impressed above. Wings hyaline, nearly always with a

strongly infumate apical cloud; radius strongly sinuate above the entire areolet; internal cubital nervure straight; median recurrent of the hind wings strongly postfurcal and emitting the nervellus at its junction with the median nervure.

Holmgren compares his genus with *Theronia*; and Cameron says (*loc. cit.*) that in its elongate face, the conformation of the areolet and of the radial nervure, this genus resembles *Lissopimpla* (= *Xenopimpla*, Cam. Manch. Mem. 1898, p. 28); but that the latter differs in having the mesonotum trilobate, the metathorax transversely striate and laterally dentate, the abdomen quite glabrous and the hind femora dentate beneath near their apices. Unfortunately he entirely overlooked the peculiar position of the nervellus, which, I have very little doubt, relates this genus and *Lissopimpla* closely with *Epirhyssa*.

The peculiarly high emission of the nervellus, figured both in 1899 (Manch. Mem. pl. iii, fig. 6) and 1905 (Spol. Zeyl. pl. B, fig. 8) in the case of the typical species, *Chrysopimpla ornatipes*, led Krieger to synonymise Cameron's genus with *Echthromorpha*, Holmg., a course which is certainly correct; it received sanction from Cameron himself in 1905.

Our knowledge of the genus has considerably augmented since Cameron stated (Trans. Nat. Hist. Glasgow, 1885, p. 265) * that its species were confined to the oceanic islands, Ascension, Hawaii and St. Helena; we now know it from broad tracts of at least Asia, Africa and Australia, though apparently confined to tropical and subtropical latitudes.

For a full account of the present genus, *cf.* Prof. Dr. R. Krieger in Mitteilungen aus dem Zool. Museum, Berlin, 1908, pp. 295–344, and my own paper on the British Museum examples (Rev. Ichn. Brit. Mus. ii, 1913, p. 36).

Table of Species.

1 (6)	Abdomen broadly testaceous or banded; metathorax glabrous, apophyses wanting.	
2 (3)	Metathorax and coxæ testaceous; abdomen mainly pale	*insidiator*, Smith, p. 99.
3 (2)	Metathorax and coxæ black and flavous; abdomen broadly black-banded.	
4 (5)	Thorax more or less punctate; areolet distinctly petiolate	*notulatoria*, F., p. 100.
5 (4)	Thorax entirely glabrous; areolet subsessile	*persimilis*, Cam., p. 101.
6 (1)	Abdomen black, with pale spots; metathorax strigose, apophyses strong ..	*intricatoria*, F., p. 102.

* There appears to be little doubt that *Echthromorpha walkeri*, Cam. (*loc. cit.*), the type of which is in the British Museum, may constitute the alternate sex of *Pimpla agrestorius*, Swed. *et* Gmel., also taken by Sir Joseph Banks and Dr. Coppinger in Tahiti.—*Cf.* Morley, Entom. 1909, p. 135.

53. **Echthromorpha insidiator**, *Smith.*

Pimpla insidiator, Smith,* Proc. Linn. Soc., Zool. vii, 1863, p. 9 (♂ ♀).

♂ ♀. A large and handsome fulvous species, with the mesothorax and variable abdominal bands, as well as an apical mark in the front wings, black. *Head* so short as to be subvertical behind the very prominent eyes; flavous, with the concave and distinctly bordered occiput centrally, the ocellar region, and the centre of the glabrous and centrally carinate frons, alone black; face superficially but distinctly punctate, quadrate and parallel-sided, obsoletely pilose and somewhat nitidulous; clypeus very large and hardly shorter than the face, basally truncate, apically broadly rounded, subglabrous; labrum strongly exserted, semicircular; mandibles curved above, apically blackish, with the upper tooth much the longer; cheeks fully as long as the basal breadth of the mandibles; eyes somewhat deeply emarginate next the scrobes. *Antennæ* filiform, slender, and as long as the body, black, with the scape flavous throughout; flagellum rufescent at the base and extreme apex, with the seven basal joints elongate and apically subnodulose; scape externally excised throughout. *Thorax* flavous, with the shallowly and irregularly punctate mesonotum (except two vittæ), its pleuræ above and in front, and the whole sternum, black; metathorax with no areæ, basally closely punctate and subrufescent, its apical half and areolar region quite glabrous; spiracles elongate and very large. *Abdomen* nearly parallel-sided and flavous, with the segments, except at their smooth apices, evenly punctate and brunneous or blackish; tubercles obsolete and the central segments obliquely incised at their basal angles; basal segment nitidulous and subglabrous, a little longer than apically broad, constricted before the base and centrally canaliculate to its middle; eighth segment discally emarginate; terebra half the length of the abdomen, black, with the spicula very stout and the valvulæ internally setiferous. *Legs* fulvous and somewhat stout, with the apices of the large and strongly curved, though not basally lobate, tarsal claws alone infuscate; anterior coxæ flavous; hind femora centrally impressed above. *Wings* ample and faintly siliceous, with a conspicuous apical infumate dot; radix and tegulæ fulvous, costa and stigma piceous, with the latter centrally rufescent; areolet obliquely subtriangular, emitting the recurrent nervure from its centre; radius strongly sinuate, internal cubital straight; first recurrent

Fig. 22.
Echthromorpha insidiator, Smith.

of the hind wings strongly postfurcal and emitting the nervellus at its junction with the median nervure.

Length 16–17 millim.

I can find no structural distinction between this species and the next, but the coloration is very different and appears to be quite constant.

There are two specimens of this species, labelled "Indrulaman, October, 1895; A. Everett," in Col. Bingham's collection. Both sexes are represented in the collections at Oxford and Genoa; the male in the former has weak alar infumescence, and the female in the latter was captured by L. Fea at Bhamo in Burma, during August, 1885. Mr. Green has just sent me a fine female taken on a window-pane in a house at Peradeniya in Ceylon, late in 1909. I have seen both sexes from Mysol, and am satisfied that the present species is *Pimpla insidiator*, Smith, from the same island, though slightly different in its paler coloration. The species also occurs from Celebes to Queensland.

54. **Echthromorpha notulatoria**, *F.*

Cryptus notulatorius, Fabricius, Piez. 1804, p. 77.
Pimpla continua, Brullé, Hist. Nat. Ins. Hym. iv, 1846, p. 92 (♀).
Chrysopimpla ornatipes, Cameron,* Manch. Mem. 1899, p. 186 (♂ ♀)
Echthromorpha læva, Cameron,* Jour. Str. Br. Roy. As. Soc. 1903, p. 135 (♂).
Echthromorpha ornatipes, Cameron, Spol. Zeyl. 1905, pl. B, fig. 8 (♀).
Echthromorpha notulatoria var. *immaculata*, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 46 (♂).

Very similar to the preceding, but with the black markings much more profuse. *Head* very narrow behind the prominent eyes; flavous, with the concave and bordered occiput centrally, the centre of the carinate frons, and usually the ocellar region, alone black; face shallowly and distinctly punctate, quadrate and parallel-sided, obsoletely pilose and somewhat nitidulous; clypeus very large and hardly shorter than the face, basally and apically truncate, surmounted by the prominent and broadly rounded labrum; mandibles sinuate above and apically somewhat infuscate; cheeks fully as long as the basal breadth of the mandibles, eyes somewhat deeply emarginate next the scrobes. *Antennæ* filiform, slender and as long as the body; black, with the base and extreme apex pale, and the basal flagellar joints elongate and apically subnodulose; scape very deeply excised externally. *Thorax* mainly black; the prothorax, two elongate vittæ on the mesonotum, a large callosity beneath and a small one before the radix, a large specular mark and a dot above the intermediate coxæ, bright flavous; metathorax often flavous laterally, but usually subrufescent, with the spiracles and a line between them and the base black; metanotum (except centrally) evenly punctate and flavous-pilose; spiracles elongate and very large. *Abdomen*

parallel-sided, evenly and distinctly punctate, black, with the apices of all the segments bright flavous, glabrous and elevated; the basal segment glabrous throughout, constricted before its base and not deeply canaliculate; basal angles of the following black and obliquely incised; seventh and eighth segments entirely castaneous and the latter discally emarginate; terebra half the length of the abdomen, stout, with the black valvulæ internally setiferous. *Legs* stout and fulvous, with the strongly curved claws blackish, but not basally lobate; anterior legs entirely flavous; the hind coxæ and trochanters concolorous, the latter always with their under and external surfaces, and a more or less broad streak above, deep black; hind femora not impressed above. *Wings* exactly as in the preceding species, but with the costa and stigma usually castaneous.

Length 7–18 millim.

This species is so very closely allied to the last-described, that I for long hesitated to accord it specific rank; but, in the sixty-seven species I have examined, all have the hind coxæ distinctly black-marked and the abdomen deep black with only the apical margins of the segments pale, whereas in the former the abdomen is mainly rufescent or at most brunneous, with very indefinite bands, and the coxæ immaculate.

The male of this species is remarkable for the very nodose base and apex of the flagellar joints; its hind femora are occasionally, and the hind tarsi always, blackish, and the thoracic black markings are, perhaps, a little less profuse than are those of the female. The size of both sexes is extremely variable.

No doubt can remain respecting the synonymy of Cameron's two species; the types of both are in the British Museum, and I have carefully examined them: the wonder is that one man could have twice described so distinct an insect. I have seen another large female, labelled "type" of *Chrysopimpla ornatipes* by Cameron also, in the Oxford Museum.

I have seen two males, which differ in no way from *E. notulatoria* excepting in the total lack of all alar infumescence. These appear worthy of a varietal (possibly specific) name, and I have proposed to term them var. **immaculata**. *E. maculipes*, Cam. (Journ. Str. Brch. R. Asiatic Soc. 1905, p. 121), from Borneo, the type of which I have seen in the British Museum, differs only in its somewhat more elongately petiolate areolet, and should be included among the synonyms of the present species.

This is one of the most abundant of Indian Pimplinæ, at least in the central and southern districts, though the late Col. C. T. Bingham captured but two females, both at Sikkim, between April and June 1900. Our earliest record is represented by a female in the British Museum, taken by Capt. Laing in October 1867 in Oudh, in Northern India. Cameron's species was first described from the Khasi Hills of Assam, and I have seen the type of both sexes in the British Museum, where are several other examples from the same locality. In the Pusa collection is a very long

series of both sexes from Samalkota in Madras, Buxa Duars, Pusa, Samastipur and Chapra in Bengal, and from Poona in Bombay, taken by Mackenzie, D. Nowrojee, G. R. Dutt and others, in and upon wild and cultivated grasses, on weeds, in fields and forests, on oats, lucerne, and in May on flowers, often while flying, during January, February, March, April, May, June, August and October. It has also been found at Peradeniya, in Ceylon (*cf.* Spolia Zeylanica, iii, pt. 10, p. 135), by Mr. Ernest Green, who has kindly sent me females from Kandy in April and May, and both sexes from Maskeliya in January. There are several old specimens from Bombay and Ceylon in the Oxford Museum. Mr. Wickwar took males at Kandy in September 1909, and Colombo, Ceylon, in April 1908. It is evidently common at Calcutta, to judge from the number in the Museum there, which also contains examples from Bangalore, captured in early September; from Mergui in Lower Burma (*W. Doherty*); and from Aijal in the Lushai Hills of Assam (*E. C. Macleod*) at an altitude of 3600 feet, in June 1904. The typical male of Cameron's *E. lœva* was found at Kuching, in Borneo, on 30th January 1902; I fail to follow his reference of it (*loc. cit.*) to Singapore, where it was, however, found commonly by Mr. H. N. Ridley in 1895 and 1904.

55. Echthromorpha persimilis, *Cam.*

Chrysopimpla persimilis, Cameron, Manch. Mem. 1899, p. 188 (♂).

"Head shining, impunctate; the front broadly, the ocellar region, the vertex and occiput, except at the sides, black; mandibular teeth black. Antennæ slightly longer than the body; the scape yellow; the base and apex of the flagellum more or less brownish. Thorax shining, impunctate, except behind the metathoracic spiracles, where it is rough and irregularly punctured, and the extreme apex of the mesopleuræ, which is crenulated; on the mesonotum are two lines, dilated at the base, narrowed towards the apex, running from the base [*sic*] to the scutellum; the scutellum, postscutellum, the base of the propleuræ, a large mark on the mesopleuræ, broad at the base and continued narrowly there to the sternum, and irregularly rounded behind, and the metapleuræ, except the base and a line running obliquely to the spiracles, yellow. The median segment [metathorax] is yellow, except for a broad hourglass-shaped mark, down the centre. The petiole is smooth and shining, impunctate; the apex broadly yellow; the black at the apex and sides running into rufous; the other segments are closely and rather strongly punctured, except on the yellow apices; the depressions are not very strongly impressed, the apical segments entirely fulvous rufous; the ventral surface yellowish. Legs fulvous; the four front coxæ and trochanters, and the hinder, except the base broadly behind, inside and out, and a mark, gradually dilated from the base to the apex in the middle, black; the hinder tarsi fuscous. Wings hyaline

except for a fuscous violaceous cloud in the apex of the radial and the top of the cubital cellules; the areolet oblique; the transverse cubital nervures unite at the top, but do not form a petiole; the recurrent nervure is received shortly before the middle of the cellule.

"*Length* 9 millim.

"This species looks like a small form of the preceding (*P.* [*sic*] *ornatipes*), with which it agrees closely in general coloration; but it is, I believe, quite distinct. Apart from the size, it differs in having the thorax quite smooth, without any punctures; the areolet is not petiolated; the abdominal depressions are very indistinct; the hinder coxæ not black marked with yellow, but yellow and fulvous marked with black above and at the side."

I quote Cameron's description of this species, which I do not know, if the thorax is really impunctate. Though the depth of the thoracic punctation is always proportionately diminished in smaller specimens of *Echthromorpha*, I have seen none quite glabrous. His other distinctions are, of course, prone to some variability throughout the ICHNEUMONIDÆ. Mr. T. Bainbrigge Fletcher has given me a ♂, with puncturation only at the base of the metanotum, captured at Madulsima, in Ceylon, on 22nd May 1908.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

56. Echthromorpha intricatoria, *F.*

Cryptus intricatorius, Fabricius, Piez. 1804, p. 77 (♀); Trentepohl, Isis, 1829, p. 847 (♀).
Ichneumon intricatorius, Thunberg, Mém. Ac. Sc. St. Pétersb. 1822, p. 278; id., *op. cit.* 1824, p. 356.
Pimpla excavata, Guillon, Ann. Soc. Ent. France, 1841, p. 302; id., Rev. Zool. 1841, p. 322 (♀).
Pimpla intricator, Erichson, Arch. Naturg. viii, 1841, p. 254.
Pimpla intricatoria, Brullé, Hist. Nat. Ins. Hym. iv, p. 90 (♂ ♀).
Echthromorpha intricatoria, Krieger, Sitz. Nat. Ges. Leipzig, 1899, p. 59 (♂ ♀).

♂ ♀. A black species with only small, well-defined, bright flavous markings and red legs. *Head* black, with the outer and frontal orbits narrowly, the whole face and mouth in ♀ red and in ♂ flavescent; frons strongly concave. *Antennæ* longer than the body, fulvous, with the flagellum (except basally) black above; joints apically nodose. *Thorax* black, with small and bright flavous dots on either side before the radices, in the centre and at the apex of the mesopleuræ, above the coxal areæ, and on the very distinct but obtuse apophyses; metathorax with no areæ, somewhat strongly trans-strigose throughout to near the glabrous apex; spiracles large and elongate. *Scutellum* and postscutellum convex, the former sparsely punctate, the latter glabrous and entirely flavous; scutellar carinæ centrally concolorous. *Abdomen* black and not strongly nitidulous, with a somewhat small and

circular flavous dot in the apical angles of the six basal segments; first segment nearly twice as long as apically broad, glabrous and shallowly sulcate to near its apex, with the prominent spiracles a little before its centre; second subquadrate and the following transverse; terebra stout and slightly longer than half the abdomen. *Legs* clear red, with the posterior coxæ and trochanters entirely, and the hind tarsi apically, black. *Wings* as in the preceding species.

Length 10–25 millim.

The great variation in size is remarkable, and individuals of the above variable dimensions, together with intermediate gradations, are represented in the British Museum.

I have drawn the above description of this abundantly distinct species from a single male in the collection of the Oxford University Museum, which is simply labelled "India." Excepting its lack of a distinct petiolar metathoracic area, it might be placed in *Allotheronia*, Ashm. (Proc. U.S. Nat. Mus. 1900, p. 57); but if such were the case, I should have no hesitation in synonymising that genus with *Echthromorpha*, from which its author so inadequately distinguishes it.

This is a common species throughout the Australasian region, well known from both Australia and Tasmania; there are examples in the British Museum collection from Queensland, New South Wales (Sydney, &c.), Victoria, King Island, Tasmania (Hobart, &c.), and a single female "bred from larva of large *Bombyx*"; this is the first intimation we have had respecting its hosts, and its detection in India—which certainly needs confirmation—extends its known distribution some thousands of miles.

Genus **HABROPIMPLA**, *Cam.*

Habropimpla, Cameron, Manch. Mem. 1900, p. 97.

GENOTYPE, *H. bilineata*, Cam.

Head broader than long; clypeus glabrous and impunctate, basally discrete and apically obliquely depressed; eyes slightly emarginate internally; mandibles bidentate, with the teeth of equal length. Apical flagellar joints subdilated apically. Mesonotum nitidulous, with the notauli obsolete; metanotum glabrous, with neither areæ nor carinæ, its disc transversely strigose; metapleuræ aciculate and apically stoutly carinate; spiracles large and linear, of equal breadth throughout, rounded at both extremities, and situated but slightly before the centre. Scutellum subdeplanate, longer than broad, and subconstricted apically, glabrous, with the deeply discreted postscutellum impunctate. Abdomen smooth, nitidulous and subimpunctate; central segments obliquely impressed laterally; the first basally impressed and tuberculate above the spiracles beyond the centre; gastrocœli of the second oblique, narrow, glabrous, and extending slightly beyond the

spiracles. Legs stout, normal, and as in *Pimpla*. Areolet oblique, sessile or subpetiolate; radius distinctly reflexed basally; wings hyaline.

Range. Assam.

"This genus comes near to *Chrysopimpla*, not only in the presence of the yellowish colour, but in the form of the areolet and in the curved apex of the radius: but differs from it in the face not being so elongated; in the much shorter clypeus, which is obliquely depressed at the apex; in the eyes being more distant from the base of the mandibles; in the spiracles being placed more behind the middle of the petiole; in the hinder tarsi being more slender and longer compared with the tibiæ; and in there being no cloud at the apex of the fore wings." (Cameron, *loc. cit.*)

It differs from *Everistes*, Först., in the linear metathoracic spiracles, &c.; no ♀ is yet known.

57. Habropimpla bilineata, *Cam.*

Habropimpla bilineata, Cameron,* Manch. Mem. 1900, p. 97 (♂).

A black species, with the scape, scutellum, metanotal stripes, and most of the legs stramineous. *Head* black, with the supra-clypeal foveæ, the clypeus, except centrally, and the palpi, flavous; mandibles immaculate and palpi white-pilose; face rugosely punctate and centrally subcarinate; frons and vertex glabrous; ocelli circumcanaliculate. *Antennæ* black, with the flagellum pubescent and basally brunneous beneath; scape punctate, flavous beneath and apically pale-pilose. *Thorax* black, with the radices, a line on the apex of the pronotum, and internally apically dilated lines on either side of the metanotum, sulphureous; mesonotum smooth, shining, with dense infuscate pubesence; metanotum centrally impressed at the base, smooth and laterally subrugulose, with the petiolar region glabrous and nitidulous; pro- and meso-pleuræ impunctate and glabrous, with their apices crenulate. *Scutellum* sparsely and postscutellum densely infuscate-pilose, the latter with its lateral impressions broad, smooth and shallow.

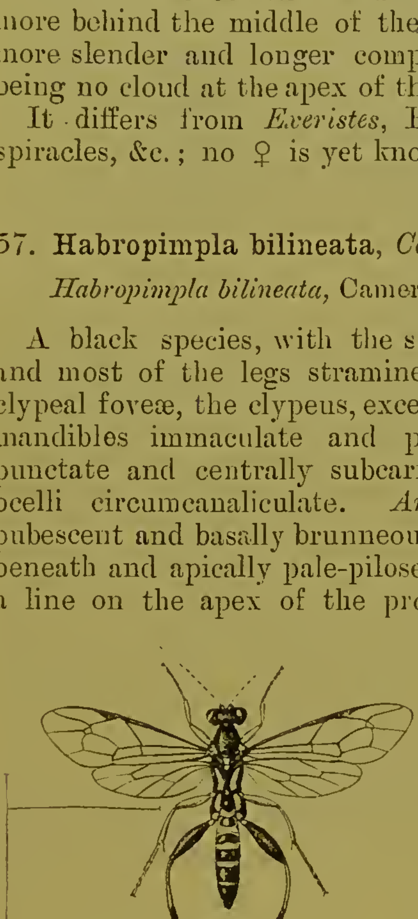

Fig. 23.
Habropimpla bilineata, Cam.

Abdomen black, with the three basal segments laterally broadly and apically narrowly, sulphureous; the fourth and fifth laterally at the apex, and the former with the whole apex narrowly, sulphureous; remainder of the second to fourth segments flavidous; three basal segments superficially punctate, the third basally

broadly and obliquely impressed. *Legs*: anterior pairs uniformly stramineous throughout; hind pair black, with the coxæ broadly centrally above, the trochanters (except at their apices), the femora above, and the tibiæ very broadly in the centre, flavous. *Wings* fulvo-hyaline, with the nervures and stigma black.

Length 14 millim.

Assam: Khasi Hills (*Rothney*).

Type in the British Museum; both antennæ are broken, and the apex of the abdomen is entirely destroyed.

The extent of the black markings on the legs is variable, especially in the case of the femora.

Genus **LISSOPIMPLA**, *Kriech.*

Lissopimpla, Kriechbaumer, Ent. Nachr. 1889, p. 309.
Xenopimpla, Cameron, Manch. Mem. 1898, p. 28.—(Type, *Rhyssa semipunctata*, Kirby).

Genotype, *L. octoguttata*, Kriech.

Face longitudinally subtricarinate; eyes distinctly emarginate internally; clypeus apically broadly rounded and of normal length; labrum exserted; mandibular teeth very small. Antennæ slender, filiform and often pale-banded. Mesonotum not transversely strigose; notauli deeply impressed and discally coalescent; metathoracic areola wanting, but petiolar area distinct; apophyses very large; spiracles large and linear. Abdomen impunctate and entirely glabrous; segments obliquely incised basally, with the second of ♀ not longer than broad; terebra shorter than body; venter strongly plicate. Front tibiæ a little inflated; hind femora dentate beneath before their apices; claws stout and simple. Areolet entire and emitting the recurrent nervure beyond its centre; nervellus emitted from junction of first recurrent with the basally entire median nervure of hind wing.

Range. Five species of this very distinct genus have been described, all from the Australasian region; and I am glad to be able to assign to its correct genus another from so much further north.

58. **Lissopimpla albopicta**, *Walk.*

? *Cryptus albopictus*, Smith, Journ. Linn. Soc., Zool. 1860, p. 61, Suppl. (♀).
Pimpla albopicta, Walker,* Ann. Nat. Hist. (3) v. 1860, p. 306 (♀).
Lissopimpla rufipes, Cameron, Spol. Zeyl. 1905, p. 140, pl. B, fig. 14 (♀).

♂ ♀. A somewhat deplanate, black and flavous species, with (in ♀) white-banded antennæ. *Head* pale stramineous, with the occiput (except immediately behind the eyes), the entire and

narrow vertex, and the centre of the concave frons, black; scrobes glabrous and large; face distinctly though not deeply punctate throughout, longitudinally tricarinate; clypeus less than half the length of the face, broadly rounded at the base and apex, a little shorter than the exserted and conical labrum; mandibles with the teeth minute and blackish, their base not broader than the length of the cheeks; eyes somewhat deeply emarginate next the scrobes. *Antennæ* setaceous and very slender, black, with the scape, and in ♂ flagellum, red beneath; eighth to the twelfth flagellar joints of ♀ pure white; joints not nodulose. *Thorax* black, with the whole sternum, large spots on the meso- and metapleuræ, elongate callosities before and beneath the radix, a transverse line below the hind wings, basal carinæ of the scutellum and postscutellum, and the three metathoracic spines, pale stramineous; notauli deeply impressed and extending to the disc; metanotum trans-strigose throughout, apophyses large and obtuse in ♀ and subobsolete in ♂; petiolar area subglabrous and basally produced into a large and stout spine; lateral costa distinct, spiracles elongate and very large. *Scutellum* of ♂ white. *Abdomen* nitidulous and entirely glabrous, stramineous, with the base of all the segments broadly black; the first distinctly longer than apically broad, with the deplanate basal carinæ pale and not extending beyond the centre; the following segments obliquely incised at their basal angles; anus and the strongly plicate venter pale; terebra exactly half the length of the abdomen, spicula red and the hardly pilose valvulæ black. *Legs* entirely ochreous, with the ♂ hind tarsi alone infuscate; claws large, curved but not lobate; hind femora distinctly dentate below at their apical third; front tibiæ subintumescent. *Wings* normal and hyaline; radix and tegulæ flavous, costa piceous, and the stigma ferruginous; areolet subsessile, obliquely triangular and emitting the recurrent nervure beyond its centre; radius strongly curved above the areolet; first recurrent of lower wings postfurcal and emitting the nervellus from its junction with the median nervure.

Fig. 24.
Lissopimpla albovicta, Walk.

Length 8–14 millim.

I had drawn up the above description before seeing the type of Walker's species in the British Museum; it is undoubtedly synonymous with *L. rufipes*, Cam., and was originally described as:—Shining and black, with the underside red. Head white, with a flavous anterior stripe, eyes internally emarginate next the scrobes, palpi white. Antennæ elongate and slender, black, with white band before their centre; scape red. Thorax with

several white marks or blotches. Abdomen cylindrical, narrower and much longer than the thorax, with two small longitudinal white basal lines and the apical margin of the segments concolorous, that of the central ones being testaceous; terebra shorter than half the body. Wings greyish and 21 millim. in expanse; costa and nervures black; areolet irregularly tetragonal, with the external less than half the length of the internal nervure.

Length 13 millim.

The description of the head as white is misleading, and no one appears to have recognised this species since it was first brought forward, although Motschulsky refers to it as occurring in Ceylon (Bull. Soc. Nat. Moscou, 1863, p. 30). Walker says (Ann. Nat. Hist. 1860, p. 306) that "this species is erroneously named *Cryptus albipictus* in the list of Ceylon insects lately published in Sir F. Tennent's work on Ceylon." But Smith's *Cryptus* is only recorded from Celebes, and is probably distinct: nor do I find such an insect in either of Sir J. E. Tennent's works on the subject.

L. albopicta is probably not an uncommon species throughout India, where it extends from Ceylon (*Dr. Thwaites*) to an altitude of 6000 feet in the Khasi Hills of Assam (*R. Turner*); I have seen examples captured in Sikkim in the Himalayas in April 1891 (*Col. Bingham*), and there is one in the Pusa collection from Naduvantum, 7000 ft., in the Nilgiri Hills of Madras (*W. Rowson*, May 1904). Cameron, who records it from both Maskeliya and Peradeniya, in Ceylon, in April and August, failed to recognise it as already described, although he refers (Spolia Zeylanica, 1905, p. 69) to Walker's types, which he supposed were not in the British Museum, "otherwise Col. C. T. Bingham would have described the aculeates in his work.... In that work he has merely reproduced Walker's descriptions." The male appears much the rarer sex, and the only example I have seen was captured by sweeping in the jungle at Peradeniya in Ceylon, in May 1909 (*E. E. Green*).

Genus XANTHOPIMPLA, *Saus.*

Xanthopimpla. Saussure, Grand. Hist. Madag., Hym. 1892, pl. xiii.

GENOTYPE, *Pimpla punctata*, F.

Body stout, flavous and more or less profusely black-marked. Head strongly oblique posteriorly; clypeus distinctly discrete, apically truncate and closely fitting upon the very large and triangular labrum; upper mandibular tooth obsolete; cheeks very short and the eyes strongly emarginate internally. Apical flagellar joint not longer than the two penultimate. Mesonotum not transversely strigose; metathorax short, with strongly carinate areæ, of which the basal is entirely wanting; spiracles large and linear. Scutellum discally subpyramidal, and foliaceously margined laterally. Abdominal impressions transverse and, at the

basal angles of the segments, oblique; second segment of ♀ not longer than broad; terebra shorter than the body. Legs stout and not elongate; apical hind tarsal joint fully twice as long as the penultimate; claws not pectinate nor basally lobate; pulvilli often strongly elongate. Areolet entire, triangular and usually subpetiolate; first recurrent nervure of the lower wings intercepted distinctly above the centre.

Range. Australasia, Malay Archipelago, Japan, China, Tibet, India and Africa.

This genus,* which was named though not described by Saussure, is well represented in India, but the species appear to be in a state of transition, and it is very difficult to determine between varietal and specific distinctions; nor has Cameron's lack of mention of the more important structural characters in his earlier papers, or his description of them in his later ones, tended to render the task of naming specimens from his descriptions easy; some of my supposed new species may be among those brought forward by him, but if such be the case I have failed to identify them. The mainly flavous body and explanate scutellar border render this genus very conspicuously distinct. The discretion of the labrum from the clypeus has hitherto been overlooked.

That *Pimpla punctator*, L. (Syst. Nat. 1767, p. 935 †) and *Pimpla punctata*, F. (Sp. Ins. 1781, p. 437) belong to the present genus appears to be tolerably certain; but to which of the modern species they are to be referred I have had until recently no idea. That they are not synonymous, as treated by Dalla Torre (Cat. Hym. 1901, p. 458), is, I think, sufficiently apparent from the circumstance that Fabricius described both (Systema Piezatorum, 1804, pp. 114 et 119). The latter considered both Linné's species as synonymous with his own *P. pedator*, which had all the abdominal segments black-marked, whereas in *P. punctator* only six are so described, and *P. punctata* has but five with a spot on either side. Van Vollenhoven has gone somewhat deeply into the matter in his paper "Einige neue Arten von Pimplarien aus Ost-Indien" (Stett. Ent. Zeit. 1879, p. 143); but he appears to have possessed insufficient material and to have been too prone to erect barely

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* Cameron (Manch. Mem. 1899, p. 163) says that *Pimpla dedator*, F., belongs to this section of the unrestricted genus; this is a *lapsus calami* for *P. pedator*, F. (Syst. Ent. 1775, p. 828). A ♀ specimen of this genus is figured, together with the cocoon from which it had emerged, in the Rev. J. G. Wood's "Strange Dwellings," p. 294; he says that a few only prey upon each host-larva, destroying it between the periods of cocoon construction and pupation, and that they themselves weave irregularly shaped, angular cocoons within that of the defunct host, which in this case was probably a moth allied to *Attacus atlas*.

† The following is Linnæus' description of *P. punctator*: "I. flavus punctis nigris, abdomine sessili. Habitat in Indiis. Corpus flavum, magnitudine vespæ minoris, sed angustius. Thorax supra nigro maculatus. Scutellum punctis 2, nigris. Abdomen sessile, cylindricum, punctis parium 6 nigris, seu in singulo segmento binis. Aculeus exsertus, abdomine brevior. Antennæ nigræ. Pedes lutei puncto 1 s. 2 nigro."

described varieties in place of species. Brullé, he contends, had (Hist. Nat. Ins. Hym. iv, p. 94) in 1846 reversed *Pimpla pedator* and *P. punctata* in respect to the conformation of their metanotal areolæ: *i. e.*, that of *P. punctator* (Brullé's *P. pedata*) is hexagonal with two quadrate areæ on either side, while that of *P. punctata* is distinctly transverse. Thereupon Vollenhoven gives the description of an insect under the former name, which agrees very well with those we now know as *Xanthopimpla lepcha* and *X. regina*, but he unfortunately omits to mention the terebral length.

Dr. R. Krieger does not pretend, in his very excellent account of the present genus (Ber. Nat. Ges. Leipzig, 1899, p. 101), to determine the species of Fabricius, but describes a ♀, agreeing with Brullé's description in every way, excepting its coloration. That it cannot, however, be referred to *P. punctator* is shown by its possession of but four abdominal spots on either side, and I am quite satisfied that it is synonymous with *P. punctata*, F., since the alternate segments are alone maculate, the areola is transverse and basally much constricted, the second segment centrally smooth and nitidulous, the third coarsely and diffusely punctate, and the terebra is deflexed and as long as the hind tibiæ with their tarsi, excepting the claws (*cf.* also Smith, Proc. Linn. Soc. ii. 1857, p. 119).

Without an examination of the type specimens, which I have been enabled to effect only in the case of the Banksian Cabinet, it is, I fear, useless to retain these ancient and insufficiently defined names.

If these insects be not killed with cyanide of potassium their coloration is often a good guide to specific distinction; but I have rarely been enabled to rely upon this feature to any extent, owing to the large percentage of ancient and more usually discoloured specimens, which have been the best at my disposal.

Xanthopimpla is known to prey upon Noctuid and Pyralid moths in India; it has also been recorded from species of *Papilio* and *Cricula*, and Mr. Rowland Turner tells me that it is parasitic upon the grand and exclusively Oriental *Ornithoptera*, Boisd., which genus, however, does not occur in Madagascar, whence *Xanthopimpla* was first mentioned by Saussure. Vollenhoven tells us it is probably destructive to several species of Lepidoptera, adding that Dr. Piepers bred a ♂ of his *X. punctator* from the pupa of *Papilio pammon*, L., in Celebes. Mr. E. C. Cotes is also said to have bred specimens from larvæ of the Bombycid moth, *Cricula trifenestrata*, in Hazenburgh (Manch. Mem. 1891, p. 5), where *Pimpla zebra*, Voll., is stated to have been likewise raised from the same species. Mr. E. P. Stebbing tells us (Journ. Bombay Nat. Hist. Soc. xvi, p. 684) that *Pimpla punctator* is parasitic upon various species of defoliating SATURNIIDÆ, but I do not know to which of the modern species to assign his observations, which are somewhat general in character, since he also remarks that various species of *Glypta*, *Pimpla*, &c., are beneficial in reducing the numbers of *Hyblera puere*, the common teak defoliator.

Table of Species.

1 (50) Abdomen distinctly punctate at least in centre of central segments.

2 (49) Mesonotal vittæ not carinate; scutellum less distinctly bordered.

3 (32) Antennæ not longer than body; areolet not or hardly petiolate.

4 (9) Metanotal areola entirely wanting beyond the costulæ.

5 (8) Areolet entire; mesonotum not centrally sulcate.

6 (7) Antennæ basally rufescent; eighth abdominal segment with two black spots .... *tigris*, Krieg., p. 113.

7 (6) Antennæ black above; eighth abdominal segment black with base pale . *varimaculata*, Cam., [p. 114.

8 (5) Areolet wanting; mesonotum longitudinally sulcate in centre .... *nænia*, sp. n., p. 115.

9 (4) Metanotal areola distinctly carinate throughout (except *X. kandiensis*).

10 (15) Areola not transverse, usually distinctly hexagonal.

11 (12) Apical radial abscissa strongly sinuate; thorax immaculate .... *immaculata*, sp. n., [p. 115.

12 (11) Apical radial abscissa hardly sinuate; thorax black-marked.

13 (14) Terebra shorter than half abdomen; scutellum subpyramidal .... *pedator*, F., p. 116.

14 (13) Terebra at least equal to half abdomen; scutellum simply convex .... *regina*, sp. n., p. 118.

15 (10) Areola more or less transverse and often not hexagonal.

16 (23) Areola only slightly broader than long and subhexagonal.

17 (18) Central mesonotal lobe sulcate; wings apically infumate .... *trifasciata*, Smith, [p. 119.

18 (17) Central mesonotal lobe entire; wings obsoletely infumate.

19 (20) Petiolar fascia entire; hind femora black-marked .... *fasciata*, Krieg., p. 121.

20 (19) Petiolar fascia centrally interrupted; hind femora immaculate.

21 (22) Second segment black-marked; hind tibiæ immaculate .... *nursei*, Cam., p. 121.

22 (21) Second segment immaculate; hind tibiæ basally black .... *transversalis*, Voll., [p. 122.

23 (16) Areola very much broader than long, constricted throughout towards base.

24 (29) Face not pyramidally prominent; only alternate segments usually black-marked.

25 (26) Third segment with only two marks black; antennæ black .... *kandiensis*, Cam., [p. 123.

26 (25) Third segment not so marked; antennæ paler.

27 (28) Third segment apically, and a line on hind tibiæ, black .... *tibialis*, sp. n., p. 124.

28 (27) Third segment, and hind tibiæ, apically immaculate . . . . *punctata*, F., p. 124.
29 (24) Face pyramidally prominent; nearly all the segments black-marked.
30 (31) Metathorax and second segment immaculate . . . . *soleata*, Krieg., p. 125.
31 (30) Metathorax and second segment black-marked . . . . *pardalis*, Krieg., p. 126.
32 (3) Antennæ longer than body, or areolet distinctly petiolate.
33 (46) Hind tibiæ with no red apical spines; length not 7–9 millim.
34 (43) Length not less than 10 millim.; mesonotal disc black-marked.
35 (36) Mesonotum closely punctate basally . . *appendicularis*, Cam., [p. 127.
36 (35) Mesonotum not or but obsoletely punctate.
37 (40) Areola of metanotum apically wanting.
38 (39) Notauli obsolescent, indicated only at the apex; basal segment shorter . . . . *kriegeriana*, Cam., [p. 128.
39 (38) Notauli extending to centre of disc; basal segment longer . . . . *sexlineata*, Cam., p. 129.
40 (37) Areola of metanotum apically entire.
41 (42) Notauli extending to disc; central segments strongly punctate . . . . *taprobanica*, Cam., [p. 130.
42 (41) Notauli obsolete and apical; central segments feebly punctate . . . . *sikkimensis*, Cam., [p. 131.
43 (34) Length not more than 6 millim.; mesonotal disc not black-marked.
44 (45) Notauli distinct; hind trochanters immaculate . . . . *minuta*, Cam., p. 132.
45 (44) Notauli obsolete; hind trochanters black-marked . . . . *parva*, Cam., p. 132.
46 (33) Hind tibiæ with three pairs of red apical spines; length 7–9 millim.
47 (48) Notauli deep; third segment banded with black . . . . *binghami*, Cam., p. 133.
48 (47) Notauli obsolete; third segment binotated with black . . . . *cera*, Cam., p. 134.
49 (2) Vittæ carinate; scutellum more distinctly bordered . . . . *honorata*, Cam., p. 134.
50 (1) Abdomen glabrous and entirely impunctate throughout.
51 (52) Metanotal areola quadrate . . . . *khasiana*, Cam., p. 135.
52 (51) Metanotal areola distinctly broader than long.
53 (56) Areolet not petiolate; occipital region black-marked.
54 (55) External areæ not laterally explanate; basal segment immaculate . . . . *indubia*, Cam., p. 137.
55 (54) External areæ laterally explanate; basal segment maculate . . . . *polyspila*, Cam., p. 138.
56 (53) Areolet petiolate; occipital region not black-marked . . . . *appendiculata*, Cam., [p. 138.

59. **Xanthopimpla tigris**, *Krieg.* (Plate I, fig. 5.)

Xanthopimpla tigris, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 75 (♂ ♀).

Pimpla curvimaculata, Cameron, Manch. Mem. 1899, p. 158 (♂).

♀. Very like *X. trifasciata*, Sm., but with black abdominal bands. *Head* very short, flavous, with the vertical occiput centrally, and the ocellar region, black; frons centrally elevated, with the scrobes large and reaching the vertex; face parallel-sided, laterally subprominent and evenly punctate throughout; clypeus with labrum nearly circular, and slightly convex basally; mandibles elongate-triangular, apically infuscate, with the lower tooth cylindrical and much the longer; cheeks obsolete and eyes strongly emarginate next the scrobes. *Antennæ* subfiliform, almost thicker towards their apices and as long as the body, infuscate, with the scape stramineous beneath; flagellum ferruginous at the base and extreme apex, with the joints elongate but hardly nodulose apically. *Thorax* nitidulous and obsoletely punctate; notauli distinct, but the mesonotum convex between them, with a band composed of three black spots across its disc, of which the exterior coalesce basally with a prescutellar black spot; mesosternum punctate and basally produced triangularly between the intermediate coxæ; metathorax with very indistinct areæ; areola wanting apically throughout; petiolar area basally weak, with no apophyses; an oblique black spot in the external areæ; spiracles linear and oblique. *Scutellum* flavous, convex, with a broadly elevated lateral border on either side. *Abdomen* flavous and distinctly shining, longitudinally and confluently punctate; a spot in centre of the two basal segments, of which the first is usually transverse, a curved band on the third and fifth, a straight one at the base of the seventh, and a dot on either side of the fourth, sixth and often eighth segments, black; basal segment glabrous, with inconspicuous carinæ, the following not very strongly transverse, deeply impressed before their not very shining apices, with tubercles wanting, their basal angles obliquely incised and the eighth segment discally emarginate; terebra one-third the length of the abdomen. *Legs* as in *X. trifasciata*, but with the whole apical joint of the hind tarsi black. *Wings* also identical, but with the recurrent nervure emitted slightly before the apex of the areolet.

Length 12–15 millim.

Sikkim, iv. 91 (*Bingham*); Assam: Khasi Hills (*Rothney, Krieger*).

I had at first considered this ♀ as no more than a colour variety of *X. trifasciata*, but the anteriorly subconvex mesonotum, broader scutellar border, and more nitidulous abdomen, with longer segments, render it sufficiently distinct, without considering the more profuse cephalic, thoracic and abdominal black markings.

Cameron, who knew only the ♂, indicates it as differing from the ♀ merely in having the metathoracic areæ for the

greater part black, all the tarsal claws alone black, a broad transverse mark on the petiole and an elongate one on either side of the sixth segment also black; the scape, he says, is covered with somewhat long fulvous pilosity and the face is slightly prominent in the centre. Krieger's description is very full and leaves no room for doubt respecting the synonymy of this species.

60. Xanthopimpla varimaculata, *Cam.*

Xanthopimpla varimaculata, Cameron, Tijds. Ent. 1907, p. 103 (♂).

♂. A luteous species, with all the segments black-marked. *Head* with the face and clypeus closely and distinctly, but not very strongly, punctate; ocellar region, and a broad irregular central mark on occiput, black. *Antennæ* black, with the scape flavous, and the flagellum piceous, beneath. *Thorax* with the notauli distinct, narrow and not extending to the centre of the sparsely and weakly punctate mesonotum; a broad irregular transverse band between the radices, united by two concolorous lines on either side of the centre to a slightly broader and more regular one at base of scutellum, the external basal metanotal areæ nearly entirely, and a smaller basal spot between them, black; areola large and apically incomplete, "the lateral apical keels being only indicated on the 2nd transverse keel"; basal external areæ entire, large, as long as basally broad and irregularly constricted apically, "their outer edge is joined to the transverse keel by a longitudinal one." *Abdomen* luteous, with black markings thus:—first segment with a large mark on its apical half which is roundly constricted gradually to its apex and semicircularly incised at its base [? second with a small spot, which is roundly constricted apically, with its base roundly dilated centrally *]; third with a large broad transverse mark, which is gradually and obtusely constricted apically, incised in the centre basally and broadly rounded laterally; fourth with an irregular basal spot on either side, which is broader then long; fifth with a broad transverse mark on its basal half which extends almost to the lateral margin; sixth with a small transverse basal spot on either side; seventh with a broad regular transverse mark on its basal half which is externally rounded and extends almost to the lateral margin; apical segment black with only its base pale; basal segment subparallel-sided, twice as long as broad and impunctate; second to sixth closely but not very strongly punctate; transverse incisions narrow and crenulate. *Legs* luteous; hind ones with an internal and external spot on the trochanters, apices of femora narrowly, base of tibiæ more broadly

* Cameron's description is very obscure and badly punctuated; no mention is made of the "second segment," which words appear to have been deleted in error.

and their tarsi, black. *Wings* hyaline, with their apices narrowly infumate; stigma and nervures black; areolet small, triangular and subpetiolate, emitting the recurrent nervure from near its apex.

Length 12 millim.

SIKKIM (*Bingham*).

Type. Location unknown.

61. **Xanthopimpla nænia**, sp. n.

♀. A species of average size, flavescent, with black thoracic, cephalic and pedal dots, and the abdomen with three series of duplicated bold marks on the central segments, the first and seventh each with a transverse band, and the second with two spots, black. Mesonotum centrally longitudinally canaliculate in front. Terebra shorter than basal segment. Wings with no areolet.

Length 12 millim.

"INDIA" (*Capt. Boys*).

No detailed description of this species is needed, since the incomplete metathoracic areola resembles only that of the two preceding species, from both of which it is at once distinguished by the centrally sulcate mesonotum, entirely wanting areolet, basally normal mesosternum, abdominal coloration and very short terebra. The sulcate mesonotum is similar to that of *X. trifasciata*, which has the areola entire, the areolet normal and the alar apices distinctly infumate.

I have seen but a single female of this abnormal species, in the collection of the Hope Department of the University Museum, Oxford.

62. **Xanthopimpla immaculata**, sp. n.

♂ ♀. A small, entirely pale fulvous species, with only the eyes, ocelli and terebra black; the stigma testaceous and the apical abscissa of the radius strongly sinuate centrally.

Length 6–8 millim.

A detailed description of this species would be superfluous, since it is so closely related to *Xanthopimpla pedator* as to render it doubtful, until minute structural points be examined, whether it really be more than a colour variety of that species. Superficially it is at once recognised by its entirely immaculate thorax, abdomen and legs, small size and pale antennæ; but a careful examination will reveal that its terebra is much shorter than in any of its allies, the radius is distinctly more sinuate and the stigma uniformly testaceous, and not piceous. That it is really distinct from *X. pedator*, however, I am not fully persuaded, since I have seen a specimen from Chapra, in Bengal, which combines the sinuate radius and the immaculate thorax with black hind tibial bases and abdominal spots, though only 8 millim. in length.

I have seen a small collection of nine specimens of this species, taken by Mackenzie at Chapra, in Bengal; and one from Dacca, in the same province, on the 11th of January, 1906. The type is in the Pusa collection, where also I have seen a ♂ from Jabalpur, in the Central Provinces, and two others bred in Eastern Bengal from the Pyralid, *Cnaphalocrocis medinalis*, Guen., together with a ♀ bred from the Hesperid, *Parnara mathias*, F., at Palur in Madras. Mr. Wickwar took a ♀ at Mankulam, in Ceylon, during November 1908, and Mr. Baly presented one to the National Collection from "India" in 1851.

63. Xanthopimpla pedator, *F.*

Ichneumon pedator, Fabricius, Syst. Ent. 1775, p. 828; id., Spec. Insect. 1781, p. 429; id., Mant. Insect. 1787, p. 264; Gmelin, Linn. Syst. Nat. 1790, p. 2698; Christ, Naturg. 1791, p. 364; Olivier, Encycl. Méth. viii, 1792, p. 183; Fabricius, Ent. Syst. ii, 1793, p. 157.
Pimpla pedator, Fabricius, Piez. 1804, p. 114.
Pimpla lepcha, Cameron, Manch. Mem. 1899, p. 163 (♀).

♂ ♀. A strongly punctate, flavous species, with the thorax and abdomen black-spotted. *Head* posteriorly declivous from the eyes, with the occiput deplanate, glabrous, black below throughout and distinctly bordered; the centre of the concave frons, and the ocelli, black; face strongly and deeply punctate and dull, apically indistinctly discrete from the transverse and apically truncate clypeus, which is surmounted by the elongately exserted and triangular labrum; mandibles somewhat small, apically nigrescent and acuminate, with the lower tooth the longer; cheeks obsolete, eyes very strongly emarginate next the scrobes. *Antennæ* a little shorter than the body, black, with the extreme apex rufescent and the scape flavous beneath. *Thorax* stout and broad before the wings; flavous, with three oblong dots across the disc of the glabrous mesonotum, another before the scutellum and one in the external areæ, black; mesosternum strongly and deeply punctate, notauli short and broad; upper metathoracic areæ very strongly carinate, with the basal area wanting; areola quadrate, apically truncate and emitting the costulæ a little behind its centre; petiolar area glabrous and entire; metathorax short, with the spiracles large and linear. *Scutellum* flavous, centrally subpyramidal and narrowly bordered throughout in both sexes. *Abdomen* flavous, not strongly shining

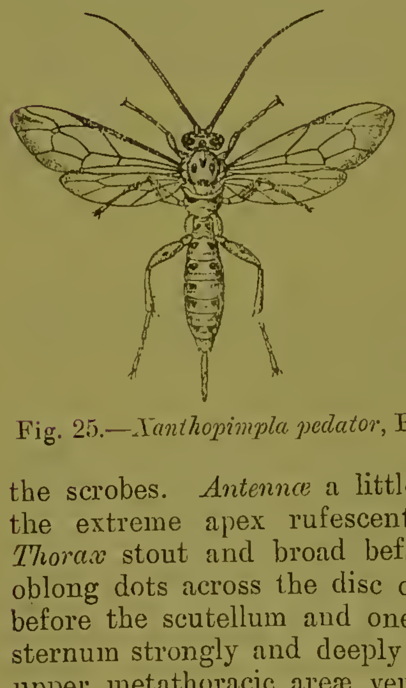

Fig. 25.—*Xanthopimpla pedator*, F.

and broadest distinctly behind the centre; the five basal segments, the seventh and sometimes the sixth with a subcircular spot, representing the obsolete tubercles, on either side; basal segment discally glabrous, with distinct carinæ extending almost to the centrally elevated apex; the following segments a little transverse, becoming broader towards the anus, transversely impressed before their hardly glabrous apices and obliquely at the basal angles; terebra hardly one-fourth of the abdominal length, stout, black, with the valvulæ indistinctly pilose. *Legs* stout and somewhat short, with a spot on the hind trochanters, on their femora internally at the apical third, the base of the posterior tibiæ and tarsi, and the hind tarsal claws, which are stout and curved (though not basally lobate, nor longer than the pulvilli), black. *Wings* ample and hyaline, hardly clouded at the extreme apex; radix and tegulæ flavous, the latter apically black; costa and the not unusually broad stigma piceous; areolet exactly triangular, almost petiolate and emitting the recurrent nervure from its centre; first recurrent of lower wings strongly postfurcal and emitting the nervellus from its upper fourth.

Length 14–17 millim.

Type in the Glasgow Museum; type of *X. lepcha* in the British Museum.

This species is certainly very closely related to the following, but will at once be recognised therefrom by the points of distinction indicated under the latter. The form described by Cameron has the mesonotal marks extending to the scutellum, and the second segment immaculate; but the abdominal spots vary in size and I have seen a female in which they were subobsolete on that segment; he says the metathorax also is immaculate, but I have seen nothing less than small black dots in the external areæ.

I consider myself entirely justified in making use of the Fabrician title for this species. I have already pointed out in my remarks on the genus that it cannot be synonymous with *Ichneumon punctator*, L.; I have examined the type of *Ichneumon punctatus*, F., in the Banksian collection; Cameron has sent a female to the British Museum bearing this name and agreeing entirely with his type there of *Pimpla lepcha*; and entirely analogous specimens have been named *Pimpla pedator*, F., by Fred. Smith.

In the Pusa collection are both sexes captured by H. H. Mason and others at Ranchi and elsewhere in Bengal, in November 1906, and January 1907; and the ♂ at Mussoori, 7000 ft., in October 1906. One ♀ was bred from an unknown Lepidopterous chrysalis, enclosed in a brownish cocoon, whence the parasite had gnawed an exit through an irregularly circular hole in the head; it is from Nagpur, Central Provinces, and another is from Koilpati, Madras. Rothney's ♀ is from the Khasi Hills, in Assam; and Bingham has three of the same sex, taken at Sikkim in April 1891 and 1900. A very large ♀ of this species was captured by the latter in the Haundraw Valley, Tenasserim, during May 1890, and is

labelled by him "*Pimpla insignata*, Smith (var.), ♀" which must be a MS. name, though the example is in the National collection; another ♀, also in the British Museum, bears a similar label and was taken by him at Poona, in Bombay, during the following November. L. Fea found one, now in the Genoa Museum, in the Karen Hills, Burma, between May and December 1888, at an altitude of 3000–3700 ft.; and Annandale took two ♀ at Balighai and Puri on the Orissa coast, at the end of October 1908. In the Calcutta Museum are a dozen specimens of both sexes, very constant *inter se*, bred from *Actias leto*, Dbld., at Darjiling, 6000 ft., taken at Margherita, Assam; at Hazaribagh, where it has also been bred from *Antheræa frithi*, Moore, and *Telegonus thrax*; one is labelled "*Pimpla criculæ*, Type" and two "Parasite that attacks *Cricula* larva, bred 10th Jan., 1889"; a ♂ also thus "Darjeeling; Ichneumon bred from *Teleg. thrax*, March, 1888." I have examined specimens in the National collection from Hong-Kong, Singapore, Chusan Island, Sandakan and Tigombong. Dr. Imms has bred this species from the small mulberry silkworm at Mussoori.

64. **Xanthopimpla regina**, sp. n.

♂ ♀. A strongly punctate, flavous species, with the thorax and abdomen black-spotted. *Head* posteriorly declivous from the eyes, occiput deplanate, glabrous, black below throughout and distinctly bordered; the centre of the concave frons and the ocelli black; face deeply and strongly punctate, not very shining, apically indistinctly discrete from the transverse and apically truncate clypeus; labrum triangular and fully as long as the clypeus; mandibles stout, apically nigrescent and acuminate, with the lower tooth the longer; cheeks obsolete, eyes very strongly emarginate next scrobes. *Antennæ* slightly shorter than the body, black, with the extreme apex rufescent, and the scape externally flavous beneath. *Thorax* stout and broad before the wings, flavous, with three oblong dots across the disc of the glabrous mesonotum, another before the scutellum, and small ones in the external areæ, black; mesosternum closely and strongly punctate; notauli short and broad; upper metathoracic areæ very strongly carinate, with the basal areæ wanting; areola quadrate, apically truncate and emitting the costulæ hardly beyond its centre; petiolar area transversely wrinkled at the base, and entire; metathorax short, with the spiracles large and linear. *Scutellum* flavous and distinctly bordered throughout; of ♂ evenly convex and of ♀ centrally subpyramidal. *Abdomen* flavous, not strongly shining and broadest distinctly behind the centre; second to sixth segments with a subcircular spot, representing the obsolete tubercles, on either side; basal segment of ♀ with indistinct carinæ extending almost to the centrally elevated apex, the ♂ carinæ prominent and terminating in the centre in a small black spot on either side;

the following segments a little transverse, becoming broader towards the anus, transversely impressed before their apices and obliquely at the basal angles; the seventh segment irregularly black in the centre; terebra four-fifths the abdominal length, stout, black, distinctly deflexed, with the valvulæ hardly pilose. *Legs* stout and somewhat short, with a spot at the base of the hind trochanters, of their tibiæ, and of their tarsi, another at the internal apical third of the hind femora, and their tarsal claws, black; claws stout and curved, though not basally lobate nor longer than the pulvilli. *Wings* ample and hyaline, hardly clouded at the extreme apex; radix and tegulæ flavous, the latter apically black; costa and the somewhat narrow stigma piceous; areolet triangular, hardly petiolate and emitting the recurrent nervure from its centre; first recurrent of lower wings strongly postfurcal and emitting the nervellus from its apical fourth.

Length 18 millim.

NEPAL; SIKKIM: Sylhet (*Bingham*); BENGAL: Chapra (*Mackenzie*, Pusa coll.); BURMA: Mandalay (*Bingham*).

Type in the British Museum.

This species is so closely allied to the foregoing that I have had considerable difficulty in convincing myself that they are actually distinct; but there can, I now consider, be no doubt that the very much longer terebra and the simply convex scutellum of the ♂ constitute sufficient grounds for separating them, more especially since I have had the opportunity of testing the reliability of these distinctions through a series of specimens and have invariably found them to be constant in every instance.

65. **Xanthopimpla trifasciata**, *Smith*.

Pimpla trifasciata, Smith,* Journ. Linn. Soc., Zool. viii, 1865, p. 64 (♀).
Pimpla apicipennis, Cameron, Manch. Mem. 1899, p. 161 (♀).
Xanthopimpla trifasciata, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 65.

♂ ♀. A pale flavidous species, with black spots on the body and on the apices of the wings. *Head* very short, entirely flavous, with the ocelli in a common black spot; occiput vertical from the posterior margin of the eyes, glabrous and not bordered; frons centrally elevated, with the scrobes large and reaching the vertex; face parallel-sided, subprotuberant laterally and deeply punctate throughout; clypeus with the labrum nearly circular and basally tuberculate; mandibles nearly triangular, apically piceous, with the lower tooth cylindrical and much the longer; cheeks obsolete, eyes strongly emarginate next scrobes. *Antennæ* filiform, slender, about as long as the body, infuscate, with the scape stramineous beneath; flagellum rufescent at the base and extreme apex, with the joints elongate and apically hardly nodulose. *Thorax* nitidulous and very obsoletely punctate; notauli deeply impressed and the mesonotum longitudinally canaliculate in front, with a band

composed of three spots across its disc, another before the scutellum, and often a small one on its pleuræ, black; metathorax with indistinct areæ, areola subhexagonal; petiolar area entire, basally somewhat strong, with no apophyses; an oblique black spot in the external areæ, spiracles linear and oblique. *Scutellum* flavous, convex, with a narrowly elevated lateral border on either side. *Abdomen* rufescent-flavidous, distinctly dull and longitudinally confluently punctate, with a distinctly transverse and occasionally confluent black spot on either side of the first and of each alternate * segment; basal segment glabrous, with inconspicuous carinæ, the following very strongly transverse and deeply impressed before their apices, which are not nitidulous; tubercles wanting, basal angles obliquely incised and the eighth segment discally emarginate; terebra one-third or one-fourth of the abdomen, black, with the valvulæ stout, basally attenuate and apically deflexed, spicula piceous and apically acuminate. *Legs* flavous, short and distinctly stout; all the tarsal claws and the base of the hind tibiæ nigrescent, the former elongate, stout, not basally lobate nor extending beyond the pulvilli; ♂ with the apical half of the posterior tarsi, and a spot on hind trochanters, black. *Wings* hyaline, with their apices determinately infumate; radix and tegulæ flavous, with their apices black; stigma somewhat short and broad, black, with the base testaceous; areolet small, triangular, emitting the recurrent nervure almost from its extreme apex; first recurrent of the lower wings very strongly postfurcal and emitting the nervellus from its upper third.

Fig. 26.
Xanthopimpla trifasciata, Smith.

Length 9–14 millim.

Nepal: Thamaspur, xi. 1908 (Ind. Mus.); Sikkim (*Col. C. T. Bingham*); Assam: Khasi Hills (Brit. Mus.); Burma: Mandalay, ix. 1898 (*Bingham*); Nicobar Islands (*Bingham*); Ceylon: Kandy and Wattamulla, ix. 1909 (*O. S. Wickwar*). Singapore (*H. N. Ridley*); New Guinea (Brit. Mus., type).

Type ♀ in the British Museum.

We must, I think, at least temporarily, regard *X. claripennis*, Cam., from Kuching, as distinct, though besides the hyaline wings it differs from the present species only in having segments two and four binotated with black.

* For Cameron's second segment, read "third" *et cont.*

66. **Xanthopimpla fasciata**, *Krieg.*

Xanthopimpla fasciata, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 92 (♂ ♀).

♂ ♀. *Head* immaculate flavous; face normally and evenly convex, a little longer than broad, somewhat closely and not very coarsely punctate; basal half of the clypeus more finely punctate than the face, and its apex rounded. *Antennæ* infuscate, beneath ferruginous, with the scape flavous. *Thorax* flavous; mesonotum finely and diffusely punctate, with a discal fascia composed of three spots, and another at the base, black; notauli reaching the centre and deeply impressed; mesopleuræ glabrous, punctate anteriorly and below, with no considerable intumescence; metanotum basally black throughout and more broadly at the sides; areola large, hexagonal, a little broader than long, extending to the centre of the disc and emitting costulæ nearly from its centre; external areæ small; dentiparal very slightly constricted internally. *Scutellum* strongly convex and vertically rounded. *Abdomen* flavous, with segments one, three, five, and seven black-banded, in ♀ the fifth segmental band centrally wanting; basal segment hardly longer than apically broad, with the carinæ extending beyond the coarsely punctate centre; second segment coarsely and diffusely, the following gradually more closely and finely, punctate; ♂ with a transverse row of six punctiform black dots on the second, and the sixth segment with black markings; terebra black and a little shorter than the hind tarsi. *Legs* flavous, with the base of the hind trochanters, of their tibiæ, and the apices of their femora externally, black; apical joint of hind, or in ♂ posterior, tarsi blackish. *Wings* hyaline, with their external margin infuscate; tegulæ black-marked; nervures and stigma black, and costa flavous.

Length 10 millim.

ASSAM: Khasi Hills.

This species is certainly very closely allied to *X. trifasciata*, Sm., in the conformation of the metathoracic areola and in the abdominal markings; but it has the central lobe of the mesonotum entire and not sulcate, the fasciæ of the metanotum and basal segment entire throughout, etc. It was described by Krieger from a single example of each sex.

67. **Xanthopimpla nursei**, *Cam.*

(?) *Pimpla punctata*, var. 1, Vollenhoven, Stett. Ent. Zeit. 1879, p. 143 (♀).

Xanthopimpla nursei, Cameron,* Journ. Bombay Nat. Hist. Soc. xvii, 1907, p. 592 (♀).

X. maculifrons, Cameron,* Journ. Bombay Nat. Hist. Soc. xvii, 1907, p. 591, ♀ (*nec* Cam. Jour. Str. Br. Roy. As. Soc. 1903, p. 138, ♀).

♂ ♀. A flavous species, with the legs wholly immaculate, but with the thorax black-marked, and with two black spots on each

of the abdominal segments except the sixth; the terebra somewhat shorter than half the abdomen, and the antennæ infuscate.

Length 9–12 millim.

United Provinces: Dehra Dun (Ind. Mus.); Sikkim, iv.–vi. 1900 (*Col. Bingham*); Assam: Margherita (Ind. Mus.); Bengal: Calcutta, viii. 01 and x. 09 (Ind. Mus.), Pusa, iii.–x. 06 (Pusa coll.), Champaran, ix. 01 (Ind. Mus.), Chapra (*A. Mackenzie*, Pusa coll.), Kushtea (*J. T. Jenkins*, Ind. Mus.); Central Provinces: Nagpur (Pusa coll.); Bombay: Surat, vii. 04 (Pusa coll.), Deesa, vi. 98 and x. 99 (*Col. Nurse*); Madras: Naduvantum, 7000 ft., Nilgiri Hills, v. 04 (*W. Rowson*, Pusa coll.). Borneo (Brit. Mus.).

Type in Col. Nurse's collection, as is also that of *X. maculifrons*.

The abdomen is much duller and more finely, closely and granulately punctate than in *X. pedator*, to which it is extremely closely allied and from which I should have hesitated to distinguish it, did it not combine the much duller abdomen with deeper segmental incisures and entirely flavous legs. I have seen a ♂ (from Sikkim) which probably merits specific rank, but which, in the absence of its ♀, I prefer to treat as a variety of this species; this has, in place of the usual black spot on either side of the abdominal segments, the entire base of all the segments somewhat narrowly black, but I can trace no structural modifications. Van Vollenhoven's female was marked with only two mesonotal spots and was taken at Amboina, in the Moluccas.

This Ichneumon has been bred at Pusa from the Pyralid moths, *Scirpophaga auriflua*, Zell., *Sylepta derogata*, F., and an undetermined species; from the "Lady's Finger Moth," in Calcutta; from *S. auriflua*, in Champaran; from a *Plusia* (Noctuidæ) and from a pupa on Juar millet, *Andropogon* (*Sorghum*) *vulgare*, at Surat. The chrysalis, from which the last emerged, is *in situ* in its own cocoon and the parasite came out by a very irregularly gnawed hole in its head.

68. **Xanthopimpla transversalis**, *Voll.*

Pimpla transversalis, Vollenhoven, Stett. Ent. Zeit. 1879, p. 146 (♂ ♀).

Xanthopimpla transversalis, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 65.

♂ ♀. Rufescent-flavous and not very shining. *Head* with a triangular black mark on the vertex, and the occiput immaculate. *Antennæ* ferruginous, infuscate above and basally testaceous beneath. *Thorax*: mesonotum with a transverse black band which is twice emarginate basally; metathorax with two circular black spots; areola transverse and irregularly hexagonal; dentiparal areæ narrow, oblique and subtriangular. *Abdomen* pale, with five pairs of oval black spots on the first, the third to fifth, and the seventh segments; the apical and second segments immaculate, the latter centrally subelevated and quadrisulcate. *Legs* flavous, with the hind tibiæ alone basally black.

Length 9 millim.

This somewhat meagrely described species is probably hardly distinct from *X. nursei,* but has the hind tibiæ basally black and the second segment immaculate. It is unknown to me.

Van Vollenhoven records this species from several islands in the Malay Archipelago and also probably from Tibet, in which case it almost certainly is to be found in India.

69. **Xanthopimpla kandiensis,** *Cam.* (emend.).

Xanthopimpla kandyensis, Cameron, Spolia Zeylanica, 1905, p. 136 (♀).

♂ ♀. A flavous species. *Head* with the face and clypeus closely and distinctly, but not very strongly, punctate; ocellar region black, occiput immaculate flavous. *Antennæ* of ♀ black, with the flagellum piceous, and the scape flavous, beneath; of ♂ entirely flavescent. *Thorax* smooth and nitidulous; mesonotum with three subcoalescent basal black marks, of which the central extends furthest apically, is longer than broad, basally transverse and rounded behind, the lateral ones are longer compared with their width, more irregular, subincised centrally at their base, rounded and constricted at their apex; metanotum with two basal black marks, which are broader than long, basally transverse and apically rounded; areola broader than long, subobliquely constricted from apex to base and in ♂ apically wanting; external areæ almost equally broad, with the outer side obliquely narrowed; "following them is an area which becomes obliquely narrowed from the base on the inner to the apex on the outer." *Abdomen* flavous, with black marks thus:—first segment with two irregular marks, which are slightly oblique and internally constricted; third with two large marks which are broader than long and laterally rounded; fifth with two somewhat similar marks which are broader and more slender compared with their length; seventh with two similar but larger marks which are the largest on the abdomen in ♀, though in ♂, which also sometimes has the fourth bimaculate, they are of normal size; two basal segments smooth, with the remainder closely but not strongly punctate; incisions closely striate; terebra fully a third the length of the body (4 millim.). *Legs* not described. *Wings* clear hyaline, with the nervures and stigma black.

Length 9–11 millim.

Ceylon: Kandy, vii. (*E. E. Green,* type), Colombo, x. and xi. (*Wickwar*); Bombay.

Cameron tells us (*loc. cit.*) that the female is "allied to *X. punctata,* F.," which he was not able to synonymise with our modern species. The conformation of the areola and the markings of the abdomen, together with the immaculate occiput render it sufficiently distinct; and I have seen two females certainly referable to it in the Oxford University Museum, which have the legs flavous, with only the extreme base of the hind tibiæ, with the apices of their claws and

pulvilli, black; the terebra is fully half the abdominal length (terebra nearly 4 millim., abdomen 7 millim.). They are both old specimens, labelled respectively "India" and "Bombay."

70. **Xanthopimpla tibialis**, sp. n.

♀. A flavous species with the thorax, and base and apex of hind tibiæ, black-spotted; the first and every alternate abdominal segment with a subcircular spot on either side, as well as an apical transverse fascia on the third segment; the antennæ pale and the terebra longer than half the abdomen.

Length 9 millim., ♀.

BENGAL: Chapra (*Mackenzie*).

Type in the Pusa collection.

Extremely similar in conformation to *X. punctata*, but at once known from it by the distinct apical fascia of the third abdominal segment and the black longitudinal streak on the outer side of the hind tibiæ, which extends to the apex from the basal third. It may, perhaps, be a curious variety of *X. punctata*, but I certainly incline to the belief that it is distinct, though a careful examination has revealed no structural discrepancies between the two species. I have seen only the type specimen of this species.

71. **Xanthopimpla punctata**, *F.*

Ichneumon punctatus, Fabricius,* Sp. Ins. 1781, p. 437; id., Mant. 1787, p. 269; id., Ent. Syst. 1793, p. 181 (♂); Gmelin, Linn. Syst. Nat. 1790, p. 2710; Olivier, Encycl. Méth. viii, 1792, p. 198.
Xanthopimpla punctata, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 101 (♀).
Pimpla ceylonica, Cameron,* Manch. Mem. 1899, p. 165 (♂).
Xanthopimpla brunneciornis (*sic*), Cameron,* Journ. Str. Br. R. As. Soc. 1903, p. 139 (♀).

♂ ♀. A flavous species, with the thorax and base of hind tibiæ black-spotted; the first and every alternate abdominal segment with a subcircular spot on either side; the antennæ infuscate and the terebra hardly longer than half the abdomen.

Length 8–12 millim.

The alternately binotated abdominal segments and apically immaculate hind tibiæ will easily distinguish this species, which in sculpture and general conformation is closely allied to *X. pedator*, F.; so closely, in fact, that it is only the constancy of the markings and areolar structure, which I have been enabled to examine through a very long series, that has convinced me that the latter is really a good species. In the thoracic and pedal markings (except that the present never has the femora internally infuscate), in the length of the terebra and the alar neuration, they are identical; but in the present species the segments are a little more transverse, very distinctly more finely and closely punctate, and the areola is fully twice as broad as long. There are, as

described by Cameron, though very rarely, black markings on the fourth segment, and perhaps more frequently in the ♂, which is presumably the sex he describes, since he makes no mention of the length of the terebra.

This species is very certainly the *X. punctata* of Fabricius and Krieger, and is with equal certainty distinct from that of Van Vollenhoven. It was with considerable satisfaction that I discovered the excellent male type of this species in the Banksian Cabinet, which was presented to the British Museum by the Linnean Society in 1863 and contains all the Banksian insects described by Fabricius in the "Species Insectorum" (*cf.* Morley, Entom. 1909, p. 136). This specimen I have compared with the types of *Pimpla ceylonica* and *X. brunneicornis*, and find that they agree to a remarkable extent for members of the present somewhat variable genus. In all the types the black markings of the fourth segment are much smaller than those of the remainder, while in some of the varieties they are altogether wanting.

Undoubtedly this is a very abundant and widely distributed species in India. It was redescribed by Cameron from a male, now in the British Museum, taken by Col. J. W. Yerbury at Trincomali, on the north-east coast of Ceylon; I have seen two males from Colombo, captured in 1902; Bingham has found it in the South Andaman Islands, as well as in Sikkim, in April 1891 and 1900; there are several old specimens of both sexes collected at "Dukhun" by Col. Sykes and in Afghanhistan by W. Griffith in the National Collection, presented by the Indian Museum in 1879; and in the Pusa collection is a series of some fifty specimens. These last were mainly captured at Chapra, in Bengal, by Mackenzie; a few at Raipur and Bilaspur, in the Central Provinces, by G. R. Dutt, in August 1907; one or two were taken on grass or while flying at Pusa, in March and October, and a female was bred from a Lepidopterous chrysalis at Surat, in Bombay, on 10th July 1904. There are two males bred at Betul, Central Provinces, and at Lahore, from the Pyralid, *Chilo simplex*, Butl.; together with other specimens from Wara-Seoni, near Balaghat, and from Saidapet and Samalkota, in Madras. Three males in the Calcutta Museum are from Bangalore; and others from Kushtea, in Bengal, Tenasserim, Sikkim, and Calcutta, taken in September and October. I have examined this species in the National Collection from Amboina, Java (Tjigombong), Singapore, China (Hong-Kong, &c.), Formosa, and Savu in the Philippines.

72. **Xanthopimpla soleata**, *Krieg.*

Xanthopimpla soleata, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 82, figs. 3, 8, 9, 14 (♀).

?*Pimpla punctata*, var. 3, Vollenhoven, Stett. Ent. Zeit. 1879, p. 143 (♂).

♀. *Head* flavous, with the frons centrally, ocelli and the occiput, black; face longer than broad, pyramidally prominent, coarsely and strongly punctate; clypeus hardly discrete basally,

obsoletely punctate and apically truncate. *Antennæ* black and basally flavous beneath. *Thorax* flavous, with the pronotum glabrous; mesonotum subglabrous and very obsoletely punctate, with three black marks forming a discal transverse band, the central confluent with another before the scutellum; notauli short and shallow; mesopleural sulci deep and longitudinal, with a distinct intumescence above them; metathorax immaculate, with conical tubercles before the spiracles; areæ complete, with the areola subhexagonal, nearly twice as broad as long and emitting the costulæ beyond its centre; dentiparal areæ quadrate and internally constricted. *Scutellum* conical. *Abdomen* coarsely and diffusely punctate, with the two basal segments glabrous and nitidulous and the anus smoother; flavous, with two black subquadrate spots on the third, fourth, fifth and sometimes the first segments, and a short fascia on either side of the seventh; second and sixth segments immaculate; terebra black and as long as the four basal hind tarsal joints. *Legs* flavous, with the hind femora bimaculate apically, the extreme base of their tibiæ, of the posterior metatarsi, and their onychii, black; hind trochanters immaculate. *Wings* flavescent-hyaline, with their apices distinctly testaceous and externally piceous; costa basally flavescent; stigma and nervures entirely, and the tegulæ marked with, black.

Length 14–16 millim.

? ♂. Head and abdomen gamboge-yellow, with the thorax and legs rufescent; head and mesothorax normally spotted, metathorax immaculate; seven pairs of abdominal spots, gradually increasing in size; the seventh segment and front legs immaculate; hind legs with a spot on either side of femora and another at the base of the trochanters piceous; base of their tibiæ and the whole of the tarsi black; areolet pyramidal and subpetiolate.

Length 11 millim.

ASSAM: Khasi Hills.

Krieger describes this species from three females, and says it differs from his *X. japponica* mainly in the distinction of the black markings. Van Vollenhoven's doubtfully synonymous male is recorded from Ambarawa, in Java. The species is unknown to me.

73. Xanthopimpla pardalis, *Krieg.*

Xanthopimpla pardalis, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 90 (♂).

♂. *Head* flavous, with a mark in the centre of the frons confluent with the concolorous ocelli, and the occiput, black; face a little longer than broad, distinctly pyramidally prominent, coarsely and irregularly punctate, and laterally subelevated; clypeus finely and sparsely punctate. *Antennæ* black, with the base flavous beneath. *Thorax* flavous; mesonotum coarsely and dispersely punctate, with the central lobe glabrous and nitidulous; notauli occupying a third of the disc; three marks forming a band across the disc black, the central basally confluent with a fourth

concolorous one at the base; mesopleuræ sparsely and somewhat strongly punctate anteriorly and below, with the sulci and intumescence distinct; metanotum with an elongate black spot in the external areæ; areola small and subquadrate, strongly constricted basally, where it is but half the breadth of the apex; dentiparal areæ triangular, anteriorly double their external length. *Scutellum* transverse, conical and vertically rounded. *Abdomen* diffusely and not strongly punctate, flavous, with two spots in the centre of each of the six basal segments, and a laterally abbreviated basal fascia on the seventh and eighth, black; basal segment half as long again as apically broad, with the carinæ extending beyond its centre. *Legs* flavous, with an elongate mark on either side of the hind femora near their apices, the base of their tibiæ, and the first and last joints of the posterior tarsi, black. *Wings* distinctly infumate-hyaline, with the apical margin obscurely darker; nervures and stigma infuscate; costa and half the tegulæ flavous, the latter partly black.

Length 14 millim.

ASSAM: Khasi Hills.

Krieger had seen but a single male of this species, which is unknown to me.

74. **Xanthopimpla appendicularis**, *Cam.*

Pimpla appendicularis, Cameron,* Manch. Mem. 1899, p. 160 (♀).
?*Pimpla punctata*, var. 2, Vollenhoven, Stett. Ent. Zeit. 1879, p. 143 (♂).

♀. Flavous; small mesonotal marks, and apices of the hind tibiæ, black; wings fulvo-hyaline, with the stigma infuscate red and the nervures infuscate. "Head yellow, except the ocellar region, which is black; face closely punctured; the clypeus smooth on the obliquely depressed apex, the base obscurely punctured. Antennæ longer than the body, black; the scape yellow, the base of the flagellum brownish beneath at the base. Mesonotum closely punctured at the base; the raised central part at the base bordered by distinct furrows; at the base of the tegulæ there is a mark, broader than long, followed in the middle by a narrower and longer one, the whole forming an almost continuous line; median segment [metathorax] smooth; the base between the keels

Fig. 27.
Xanthopimpla appendicularis, Cam.

narrowly black; the black continued along the inner side of the lateral keel, becoming gradually wider to the base behind, and slightly extending beyond the outer side of the keel; the middle keel broadly curved and united to the apex of the segment by a lateral one; pleuræ smooth, shining. The basal depression of the scutellum black; the keel to the middle large and leaf-like, on the apical half much smaller; the scutellum sparsely covered with long, black hair. The petiole broadly, but not deeply, depressed at the base; its sides stoutly carinate; the keels continued down the apical part to the raised middle of the apex, the part between being depressed, broadly at the base, narrowly at the apex; the second segment black at the base, the black bifurcating to the furrow at the sides; there is a broad, continuous, transverse line on the centre of the third, a line about three times as long as it is broad on the sides of the fourth, a continuous line on the fifth, a short mark in the centre on either side of the sixth, and an almost complete one across the seventh segment, black; terebra 5 millim., the sheaths of the ovipositor black. Legs coloured like the thorax; the basal joint of the hinder trochanters on the underside, a large mark on the underside of the hinder femora in the middle, the apex of the tibiæ and the apical two joints of the hinder tarsi, black. Wings with a distinct fulvous-smoky tinge; the costa rufo-testaceous; the stigma rufo-fuscous; the nervures fuscous; areolet shortly, but distinctly, appendiculated, triangular; the recurrent nervure received in the apical third.

"*Length* 15 millim."

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

This species appears to be related to Van Vollenhoven's variety in its petiolate areolet: but all the legs of the latter are flavous throughout, and the abdominal spots are small; it was captured at Ambarawa, in Java.

75. Xanthopimpla kriegeriana, *Cam.*

Xanthopimpla kriegeriana, Cameron, Zeits. Hym.-Dip. 1908, p. 38 (♀).

♀. Flavous. *Head* smooth, with the ocellar region triangularly black, face densely and clypeus less densely white-pilose. *Thorax* smooth; mesonotum with three large apical marks, of which the lateral are irregularly oval, and the central larger and broader than long; notauli slender and indicated only on the apical slope; metanotum with the basal lateral areæ black, large, and pentagonal, internally elongate and roundly curved, externally with the basal half almost straight and the apical obliquely sloped to the lateral carina, where it forms a sharp angle with the inner one; all the other areæ wanting. *Abdomen*: basal segment with two black marks, less than one-fourth longer than apically broad, with its basal impression laterally carinate; the remaining segments broader than long, the second and apical smooth, remainder closely and

distinctly punctate; the second to sixth transversely impressed before their apices; the third, fifth, and seventh segments with two larger and broader marks than those of the first; all these black marks are broader than long, the first pair are internally obliquely constricted, the second irregular and narrowed internally, the third not strongly constricted at their apices, and the fourth subparallel-sided; terebra 1·5 millim., or slightly shorter than the hind tarsi. *Legs*: base of the hind trochanters and of their tibiæ black. *Wings* hyaline, with their apices slightly clouded; stigma and nervures black; areolet broad, shortly petiolate, and emitting the recurrent nervure before its centre.

Length 10 millim.

SIKKIM (*Bingham*).

Unknown to me.

76. **Xanthopimpla sexlineata**, *Cam.*

Xanthopimpla sexlineata, Cameron, Tijds. Ent. 1907, p. 103 (♂).

♂. A luteous species, with black markings and the basal segment immaculate. *Head* with the face longer than broad and closely punctate; ocellar region triangularly black; occiput immaculate luteous. *Antennæ* black, with the scape luteous beneath and the flagellum basally piceous. *Thorax* with notauli extending to the centre of the obsoletely punctate mesonotum and all the pleuræ smooth; mesonotum with a broad irregular band between the radices, a shorter and more slender one before the scutellum, and a large irregular mark in the centre of each of the basal external metathoracic areæ, black; areola wanting; basal external areæ alone entire, twice as broad externally as internally, with the external apical angles spinosely produced, and the carinæ extending halfway down the sides. *Abdomen* luteous, with the second to seventh segments each with a broad irregular basal transverse black line; basal segment about half as long again as broad, glabrous, with its apex centrally strongly punctate; remainder closely punctate, becoming gradually smoother towards the anus. *Legs* luteous; hind ones with the base of the tibiæ and of the fifth tarsal joint narrowly black, apex of the latter much more broadly black. *Wings* hyaline, with their apices hardly infumate; stigma and nervures black; areolet small and shortly but distinctly petiolate, emitting the recurrent nervure from its centre.

Length 14 millim.

SIKKIM (*Bingham*).

Unknown to me.

77. **Xanthopimpla taprobanica**, *Cam.*

Xanthopimpla taprobanica, Cameron, Spolia Zeylanica, 1905, p. 135 (♀).

♀. A pale flavous species, with black markings. *Head* with

the face rugosely, and the base of the clypeus sparsely, punctate; ocellar region triangularly black; occiput immaculate flavous. *Thorax* with the notauli extending to shortly beyond the centre of the smooth and impunctate mesonotum; all pleuræ impunctate; a broad and irregularly trilobate band across the base of the mesonotum between the radices, a large basally curved transverse mark extending to the scutellar fovea, and a broad and centrally constricted basal metanotal band, black; metathorax with the areola large, basally incomplete, apically truncate, longer than broad, and laterally angled

ig. 28.—*Xanthopimpla taprobanica*, Cam.

s..ghtly beyond its centre; external areæ laterally roundly curved ana externally broader; "the second large, broad, oblique, of equal width throughout; the apical lateral area triangular; the apex on the outer side, the upper angle longer than the lower." *Scutellum* roundly convex, with its lateral carinæ not very stout. *Abdomen* flavous, with the black markings thus:—first segment with two large oblique central marks which are dilated in the centre at the base; second with a small oblique mark which is obliquely constricted basally and apically; third with a large broad band which is irregularly constricted laterally and slightly incised at both base and apex; fourth immaculate; fifth with two large broad bands which are externally rounded; penultimate with a broad band on its basal half; apical with two marks. Basal segment distinctly longer than apically broad, smooth, with only some central punctures; second to fourth segments closely and strongly punctate, with crenulate incisions; terebra as long as the hind tarsi or one-fifth of the body (2 millim.). *Legs* flavous, with the apex of the intermediate femora and the base of their tarsi, most of the hind trochanters, a broad band on the lower part and extreme apices of their femora, base of their tibiæ, and their tarsi almost entirely, black. *Wings* hyaline, with their apices infumate; tegulæ black-marked; areolet small, oblique, triangular, and shortly petiolate.

Length 10 millim.

Ceylon: Kandy (*E. E. Green*).

I have examined a female, now in the Oxford Museum, which was captured in Ceylon by Thwaites in 1872. In Prof. Krieger's work on the genus *Xanthopimpla* (Bericht. d. Naturf. Ges. zu Leipzig, 1899, p. 69) this species is said to be most closely allied to his *X. splendens*.

78. **Xanthopimpla sikkimensis**, *Cam.*

Xanthopimpla sikkimensis, Cameron, Tijds. Ent. 1907, p. 100 (♀).

♂ ♀. A luteous species, with black markings and the second segment immaculate. *Head* with the face closely and strongly, clypeus much more sparsely, punctate; ocellar region with an elongate triangular black patch from the centre of the frons, which is continuous with a larger semicircular occipital black mark. *Antennæ* black, with the scape centrally flavous, and the flagellum basally piceous, beneath. *Thorax* smooth, with the notauli only apically distinct and the mesopleuræ obsoletely punctate; mesonotum with a broad transverse apical band which has its apex roundly trilobate, with the lobes of equal size, and a large semicircular mark which covers the base and touches the scutellum; metanotum with a basal transverse band which is centrally constricted, black. Areola large and hexagonal; basal external areæ large, parallel-sided, and apically rounded; dentiparal areæ quadrangular and externally widened. *Abdomen* luteous, with black markings thus:—first segment with two irregular apical marks, which are apically united by a slender and irregular transverse band; third with a broad transverse line on the basal half, which is rounded and slightly constricted basally in the centre and is apically transverse; fourth with two broad lines, which are basally rounded and apically transverse; fifth with two slightly shorter lines, which are further apart than those on the fourth and are transverse at both base and apex; sixth with small basal lateral spots; seventh with a broad transverse basal line. Basal segments about one-fourth longer than broad, the remainder transverse, with the central ones weakly punctate; incisions, and especially the central, superficial and weakly crenulate; terebra distinctly longer than the four basal joints of the hind tarsi or one-fifth of the body (2 millim.). *Legs* luteous; hind ones with the basal joint of the trochanters, two somewhat elongate oval lines on the inner and outer half of the femora (of which the inner is the larger), a narrow line at their apex, a slightly larger one on the tibiæ, and the apices of the tarsi, black. *Wings* hyaline, with their apices narrowly infumate; areolet shortly petiolate, emitting the recurrent nervure very slightly beyond its centre.

Length 10 millim.

SIKKIM (*Bingham*).

The size of the black markings in the ♀ is said to be of variable extent, and sometimes the intermediate tibiæ are also externally black-marked.

The female was described from material collected by Col. Bingham in the Himalayas of Sikkim. There is in the Calcutta Museum a specimen, which I here place as the male of this species with some confidence, since it differs from the description of the female in little but its immaculate fourth and sixth segments; it is labelled "Kankondigee, 24 Perghs. Sunderbuns, 15th November 1909; *J. T. Jenkins.*"

79. Xanthopimpla minuta, *Cam.*

Xanthopimpla minuta, Cameron, Spolia Zeylanica, 1905, p. 137 (♀).

♀. A flavous species, with the second segment immaculate. *Head* with the face minutely punctate; ocellar region triangularly black. *Antennæ* distinctly longer than the body, with the scape mainly flavous, and the flagellum piceous, beneath. *Thorax* smooth and shining, with the mesonotum discally immaculate, its base transverse and the notauli distinct, with the central lobe clearly discrete. Metathorax with the basal external areæ clearly defined, broader than long, broad on the outer and becoming gradually constricted acuminately on the inner side; areola wanting, lateral carinæ distinct. *Scutellum* with the basal fovea black. *Abdomen* closely punctate, with distinct and striate incisions; apical half of the basal segment elevated, clearly discrete, smooth, parallel-sided, and twice as long as broad. Two marks on basal segment, a transverse line on third, two closely approximate marks on fourth, two more broadly separated on fifth, two further apart on sixth, and a line on seventh, black; terebra short. *Legs* flavous, with the hind tibiæ basally black-marked. *Wings* hyaline, with the nervures and stigma black.

Length 5 millim.

CEYLON: Kandy (*E. E. Green*).

This species is said by its author (*loc. cit.*) to be easily distinguished from *X. parva*, which I suspect of being its alternate sex, "by the distinct parapsidal furrows and by the mesonotum being transverse, not rounded, at its base" (? apex).

80. Xanthopimpla parva, *Cam.*

Xanthopimpla parva, Cameron, Spolia Zeylanica, 1905, p. 136 (♂).

♂ ♀. A small pale flavous species, with the second segment immaculate. *Head* with the face closely punctate; ocellar region triangularly black. *Thorax* impunctate, with the notauli only indicated apically; an irregular transverse basal band on the mesonotum, a mark at the base of the scutellum, two basal metanotal marks narrowed from the outer to the inner side, black; base of mesonotum rounded; metathorax with the basal external areæ large, semicircular, and enclosing the dark marks. *Abdomen* closely punctate, with the two basal segments smooth; first, third, and following segments with black marks, broader than long; incisions striate. *Legs* flavous; hind ones with two small marks on the trochanters, one at the base of the tibiæ, and a smaller one at the base of the tarsi, black. *Wings* clear hyaline, with the apices but slightly infumate; nervures nigrescent.

Length 6 millim.

The female is in every way analogous and hardly larger; the mesonotal fascia is discal, and the scutellum is not preceded by a black mark; the fourth abdominal segment is immaculate; the notauli are sufficiently distinct apically, though very short; and the terebra is as long as the basal segment.

CEYLON: Peradeniya, Haragama, Kandy (*E. E. Green*).

81. **Xanthopimpla binghami**, *Cam.*

Xanthopimpla binghami, Cameron,* Zeits. Hym.-Dip. 1908, p. 39 (♀, as ♂).

♀. Flavous. *Head* with the ocellar region triangularly black; face densely white-pilose and closely, but not strongly, punctate; frons and vertex smooth and glabrous. *Antennæ* with the flagellum piceous beneath and black above. *Thorax* glabrous; mesonotum with a broad and somewhat irregular black band between the tegulæ, which it does not quite reach; notauli deeply impressed; metanotum laterally carinate, with the lateral basal areæ black, broader than long, with the sides slightly oblique and the inner the longer, apically contracted to a rounded point; all other areæ wanting. *Abdomen* glabrous and nitidulous to the transverse impression of the second segment, thence closely and distinctly but not very strongly punctate, the segments broader than long and the apical impressions on the second to fifth distinct, curved, and trans-striate; basal segment hardly one-fourth longer than broad, though longer than the next, with two irregular transverse black marks; second segment longer than apically broad; third basally impressed, with a broad and irregular transverse black band in the centre; fifth with two broad transverse marks, and the seventh with a narrow transverse basal band, black; terebra one-seventh the length of the body. *Legs* flavous, with a short black line at the base of the hind tibiæ, each of whose apices bears three pairs of bright red spines. *Wings* hyaline and apically slightly clouded; stigma and nervures black; areolet shortly petiolate, emitting the recurrent nervure from its centre.

Fig. 29.—*Xanthopimpla binghami*, Cam.

Length 7 millim.

SIKKIM (*Bingham*).

Type in the British Museum.

A mutilated specimen, without abdomen, in the Calcutta Museum, differs from the type of this species only in having the scutellar fovea also black; it was taken by Annandale at Kulattupuzha, west base of Western Ghats, Travancore, 19th November, 1908.

82. **Xanthopimpla cera**, *Cam.*

Xanthopimpla cera, Cameron, Zeits. Hym.-Dip. 1908, p. 38 (♀).

♀. Flavous. *Head* smooth and shining, with the ocellar region triangularly black; face and clypeus white-pilose. *Thorax* smooth and shining; mesonotum with a broad and laterally dilated line between the tegulæ; notauli slender and indicated only on the apical slope; metanotum laterally carinate, from the apex of its upper third a carina runs obliquely to near the inner angle of the basal lateral areæ, which are not quite entirely black, their inner carina forming two oblique slopes, of which the inner is the shorter and more rounded, being neither so straight nor so oblique. *Abdomen* closely punctate from the base of the third segment and more finely towards its apex, with an apical transverse impression on segments two to six; basal segment with two black and externally dilated spots; third with two broad, transverse black marks; fifth with two longer and narrower transverse marks; seventh with two yet narrower and subcoalescent ones; terebra 1·5 millim., or slightly shorter than the hind tarsi. *Legs* with the apices of the hind femora black. *Wings* hyaline with nervures and stigma black.

Length 9 millim.

SIKKIM (*Bingham*).

Cameron tells us (*l. c.*) that "this species is closely related to *X. binghami*; it is larger, has all the marks on the abdomen separated, those on the first segment are distinctly narrowed on the inner side, not dilated there; the inner keel of the lateral areæ forms a broad, rounded curve, without angle, it being also wider compared with the width [*sic*], and there is an area, open on the inner side, which does not exist in *X. binghami*." How far these points will prove constant one does not yet know. The species is unknown to me.

83. **Xanthopimpla honorata**, *Cam.*

Pimpla honorata, Cameron, Manch. Mem. 1899, p. 170 (♀).

♀. "*Head* smooth, shining, the face thickly covered with short white hair; the clypeal foveæ deep, large; the mandibles black; the palpi pale dirty yellow. *Antennæ* nearly as long as the body, stout, not tapering much towards the apex, closely covered with short pubescence, dull rufous, darker towards the apex. *Thorax*

smooth and shining; the mesonotum and scutellum dull olive; the former with three large, almost united, marks between the tegulæ, keeled down the sides and round the apex; median segment [metathorax] with a gradually rounded slope, impunctate, glabrous; at its base are two large areæ, one on either side; they are broader than they are long, and triangularly narrowed at the apex; from its centre a curved keel runs to the apex of the segment, its apical part being thicker than the basal; before its middle, on the inner side, and joined to it, is a short, oblique keel; pleuræ smooth and shining, glabrous; the metapleuræ with a curved keel above and below; the tubercles are distinct. The *scutellum*, rounded from the base to the apex, not much raised above the mesonotum, but its apex considerably so above the post-scutellum, which is depressed laterally at the base; the lateral depressions large. [*Abdomen*]: the first, third, and fifth segments are broadly marked with black in or near the middle, the mark on the fifth being interrupted; the base of the petiole largely depressed; the inner side of the depression carinate, the keels being continued into the apical part to near the end of the segment; on the apical third is a transverse row of deep punctures; the second to fifth segments are closely punctured; the transverse depressions are longitudinally striated; terebra 1 mm. *Legs* stout; the anterior olive-coloured, as are also the middle coxæ; the hinder knees are black, the tarsi are infuscated. *Wings* hyaline, the stigma blackish, the nervures paler; the areolet is shortly appendiculated; the recurrent nervure is received in the middle.

"Length 8 mm.

"The colour of the abdomen and legs is doubtful, as the ferruginous tint of the abdomen and legs may be caused by chemical discoloration; but structurally it is distinct from any of the yellow species. The scutellum is more distinctly keeled at the apex than in the yellow species, the apical and the lateral keels being continuous."

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

84. Xanthopimpla khasiana, *Cam.*

Pimpla khasiana, Cameron,* Manch. Mem. 1899, p. 168 (♀).

♀. A fulvous species with black markings and the wings apically infumate. "*Head* with the face thickly covered with white hair; the ocellar region and a wider mark, rounded above, in the centre of the front, black; face coarsely punctured; the sides stoutly keeled near the eyes; the clypeus obscurely punctured; the depressed apex almost smooth; mandibles obscurely punctured at the base, covered with white, intermixed with fulvous, hair; the teeth black, piceous behind; the palpi fulvous, covered with short

hair. *Antennæ* black; the scape yellowish beneath; the base of the flagellum brownish. *Mesonotum* shining, impunctate; in the middle is a large, black mark, extending from near the base to the apex; its apex almost transverse, but slightly incised in the middle; beyond its middle the mark becomes narrowed gradually but distinctly, then becomes dilated into a triangle, which at its apex, is slightly wider than the widest part of the basal portion; the lateral marks are slightly wider than the central; they are as long as the basal part of the central mark; slightly dilated in the middle on the outer side, and oblique at the apex; median segment [metathorax] smooth; the central basal area almost square; from its centre and apex two stout keels run to the sides where they unite with a longitudinal keel, thus forming two lateral areæ on each side; pleuræ very smooth and shining; on the metapleuræ is a curved keel in the middle. *Scutellum* pyramidal; the

Fig. 30.—*Xanthopimpla khasiana*, Cam.

top with a short, transverse keel-like projection; the lateral keels large, leaf-like and of nearly equal height throughout; the post-scutellum with the sides bluntly keeled. The first and second segments of the *abdomen* are smooth and shining; the keel on the sides of the petiole extends to the middle—to the base of the black dot; the transverse, curved furrow on the second segment is longitudinally striated; those on the other segments are also striated, but not so distinctly; the black marks on the petiole small, on the second segment slightly larger and dilated in the middle at the apex; on the third and fourth larger, on the fifth and sixth still larger, broader, being distinctly broader than they are long; on the sixth [*sic*] small and may be absent; the sixth has a wide, transverse band, incised in the middle at the apex; the oblique furrows on the last segment narrow, deep, and distinct; terebra 2 mm. *Legs* stout, thickly covered with fulvous hair; on the apical third of the hind femora, on the inner side at the

top, is a black mark, which is dilated below on the lower side; the base of the hinder tibiæ, the extreme base of the tarsi and their apical joint, black; the apices of the four anterior claws are black. *Wings* hyaline, the apices of both smoky; the nervures and stigma black; the areolet triangular, slightly appendiculated; the recurrent nervure is received almost in the middle.

"Length 16 mm."

ASSAM: Khasi Hills (*Rothney*).

Type in the British Museum.

Cameron says (*loc. cit.* p. 163) that this species is very similar to *X. pedator*; but may be known from it by the marks on the mesonotum being smaller, by the abdomen being impunctate, the petiole longer compared with the second segment and by the two basal segments not being centrally canaliculate; the areola is not transverse nor constricted from its centre; and the apical lateral areæ are said to be broader, compared with the basal. I have seen the typical female in the British Museum, which is very probably nothing but a form of *X. pedator*, F.

85. **Xanthopimpla indubia**, *Cam.*

Pimpla indubia, Cameron,* Manch. Mem. 1899, p. 166 (♀).

♀. A flavous, impunctate species, similar to *X. khasiana*. "*Head* yellow; the occiput except at the sides, the ocellar region and the front in the middle, black; the black on the front gradually narrowed to a point at the apex, dilated at the base; the face closely punctured; the sides bluntly keeled to near the apex, which is only obscurely punctured; the clypeus smooth; the tips of the mandibles black. *Antennæ* longer than the body, black; the extreme apex rufous; the basal three joints yellow beneath. In the middle of the *mesonotum* is a cup-shaped black mark, the narrow basal part being as long as the dilated apical, which, at the base, is roundly incised; the lateral marks as long and as wide as the dilated part of the central; they are narrowed gradually to a point at the apex; the base on the inner side transverse; on the outer, obliquely truncated; the central area and the base of the median segment distinctly broader than it is long; the lateral keels straight, slightly, but distinctly, diverging towards the apex; the apical keel slightly and gradually curved; the basal lateral keel large, not much wider on the outer side; the apical oblique, considerably widened from the inner to the outer side; the mesopleural tubercles large, sharply projecting; the middle below them also projecting, but not so acutely. *Scutellum* pyramidal, smooth; looked at from behind it is somewhat triangular, with the sides straight, smooth, impunctate, and covered rather thickly with long, fuscous hair; the keel on the lower side leaf-like, large; the keel on the sides of the postscutellum narrow. *Abdomen* shining, impunctate; a black mark on either side of the second, third, and fourth segments, those on the second slightly smaller, more irregular and not so square, and a transverse band, narrowed in

the middle at the apex, black; the sheaths of the ovipositor black. *Legs* coloured like the thorax; the femora with a more fulvous tinge; a mark on the upper side of the hinder femora near the apex, the extreme base of the hinder tibiæ, their apex narrowly, all the claws and the apical joint of the hinder tarsi, black. *Wings* hyaline, the areolet triangular above; the recurrent nervure is received in the middle.

"Length 15 millim.

"Similar in coloration to *P. lepcha*, Cam. [*P. pedator*, F.], having only six marks on the abdomen; but that differs in having the middle segments of the abdomen strongly and distinctly punctured; *P. khasiana* comes near to it also, but is longer, has more marks on the abdomen, has the central basal mark on the median segment as long as broad, whereas in *P. indubia* it is distinctly wider than it is long, and the alar nervures from the stigma are distinctly fuscous."

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

86. **Xanthopimpla polyspila**, *Cam.*

Xanthopimpla polyspila, Cameron, Tijds. Ent. 1907, p. 101 (♀).

♀. A luteous species, with black markings and the second segment spotted. *Head* with the face closely, distinctly, and uniformly punctate; ocellar region with a triangular black patch from the centre of the frons, continuous with a large central occipital black mark. *Antennæ* black, with the scape broadly flavous, and the flagellum basally piceous, beneath. *Thorax* entirely smooth and nitidulous; mesonotum with a central "wine-glass-shaped" mark which is slightly incised in the centre of its base, basally twice as long as broad, apically broad and occupying the scutellar fovea; metanotum with a transverse basal black mark which is centrally constricted, not extending to the centre of the areola and laterally extended to slightly beyond the external areæ. Areola large, hexagonal, and broader than long; basal external areæ clearly defined, quadrangular and externally dilated. *Abdomen* smooth and nitidulous, with the black markings thus:— first segment with two irregular subcentral marks, second to sixth with two larger transverse ones of which those on the second and sixth segments are smaller than the remainder, seventh with a broad basal transverse line and two small central spots. Basal segment more than half as long again as its apical breadth, remainder transverse; incisions narrow and crenulate; terebra slightly longer than the hind tarsi or just one-third the length of the body (3 millim.). *Legs* luteous; intermediate tibiæ with a small basal black spot and a larger, more elongate one beyond their centre; hind legs with coxæ broadly basally above, a broad oblique subapical mark on the inner and a much smaller one on the outer side of femora, base of tibiæ narrowly, internal and external marks beyond their centre, and the apices of tarsi, black. *Wings* hyaline,

with the stigma and nervures black; areolet small and triangular, emitting the recurrent nervure from its centre.

Length 9 millim.

SIKKIM (*Bingham*).

Unknown to me.

87. **Xanthopimpla appendiculata**, *Cam.*

Xanthopimpla appendiculata, Cameron, Fauna Mal. et Lacc. Arch. I. i. p. 51 (♂ ♀).

♂ ♀. *Head* not much developed behind the eyes, and there roundly and obliquely narrowed, flavous, except the ocellar region, where there is a mark longer than broad, which extends to the end of the vertex and is rounded in front; the face is strongly and closely, the clypeus less strongly, punctate. *Antennæ* with the scape pale flavous; the flagellum brownish. *Thorax*: on the base of the mesonotum are three black marks touching each other; the central is about as wide as long, transverse at the base and apex, and with the sides bulging roundly; the lateral marks are larger, their bases straight and slightly oblique, their outer side is rounded outwardly, on the inner they are obliquely narrowed; on the base of the median segment are two black, ovoid marks, placed transversely, the broad end on the outerside; the basal area is wider than long, it becomes gradually but not greatly widened towards the apex, which is transverse; the outer basal areæ are wider than long, the areæ next to them in front are triangular, oblique, and longer than the width of the base, where the bounding keel bulges out; pleuræ smooth and shining. *Abdomen* with twelve black marks; the pair on the petiole are broader than long, and have a short, sharp projection on the inner side at the base; the second pair small; the third are the largest, about as wide as long and rounded on the inner side; the fourth pair smaller and somewhat similar in shape; the fifth distinctly wider than long, the sixth still wider but not so long; remaining segments immaculate. In the ♀ there are no marks on the second segment, that on the fourth is very small; in the middle of the last segment are two curved oblique furrows; terebra 4 millim. *Legs* coloured like the body; the hinder tibiæ black at the base. *Wings* clear hyaline; the nervures and stigma black; the areolet distinctly appendiculated.

Length 11 millim.

LACCADIVE ISLANDS: Minikoi (*Prof. Stanley Gardiner*).

Its author regarded this species as closely allied to *X. punctata*, F.

Genus **THERONIA**, *Holmg.*

Theronia, Holmgren, Öfv. K. Sven. Vet.-Ak. Förh. 1859, p. 123; id., K. Sv. Vet.-Ak. Handl. 1860, p. 16.

GENOTYPE, *T. atalantæ*, Poda.

Head short, transverse and declivous behind the ocelli; clypeus not elongate, slightly elevated transversely in the centre and

apically truncate; mandibles somewhat broad, with the apical teeth of equal length; eyes oblong, touching the base of the mandibles and emarginate next the scrobes. Antennæ somewhat short and stout, filiform, with the scape externally excised and flagellar joints cylindrical. Thorax impunctate, stout and gibbulous, a little longer than high; notauli apically distinct; metanotum areated, spiracles large and elongate. Scutellum convex. Abdomen very smooth and not at all punctate discally; segments transverse and somewhat uneven, with the basal canaliculate; terebra emitted from a ventral fold, a third or a half the length of the abdomen. Legs somewhat stout, with the hind ones incrassate; claws simple, pulvilli large; * hind femora crenulate apically beneath. Wings with the areolet sessile and irregularly subpentagonal.

Range. Both hemispheres.

This genus differs from *Pimpla*, which it strongly resembles in shape and general facies, in its impunctate and entirely glabrous abdomen and incrassate hind femora.

Table of Species.

1 (2) Metathoracic areola pyriform and apically strong	*clathrata*, Krieg., p. 141.
2 (1) Metathoracic areola quadrate and apically obsolete.	
3 (8) Metanotum discally transcarinate; ocellar region immaculate.	
4 (7) Second recurrent emitted from beyond centre of areolet.	
5 (6) Wings apically infumate; scutellum apically black.	*nigrobalteata*, Cam., p. 142.
6 (5) Wings hyaline throughout; scutellum immaculate	*iridipennis*, Cam., p. 142.
7 (4) Second recurrent emitted from centre of areolet	*gracilis*, Cam., p. 143.
8 (3) Metanotum centrally glabrous throughout; ocellar region black.	*maskeliyæ*, Cam., p. 144.

* According to Ashmead (Proc. U.S. Nat. Museum, 1900, p. 55) *Theronia* has the "claws very large, strongly pectinate," and this is blindly followed by Cameron (Spolia Zeylanica, 1905, p. 134). I pointed out (Ichn. Brit. iii. p. 50) that this genus has the "claws simple, pulvilli large"; for Holmgren nowhere makes any mention of their conformation, but Taschenberg (Zeits. Ges. Nat. 1863, p. 256) says of Gravenhorst's types of the typical species, *T. flavicans*, Grav. (=*atalantæ*, Poda), "Hinterbeine kräftig, besonders ihre Schenkel; Klauen aller einfach, ein gestieltes Polster dazwischen." Actually the claws are large, curved, apically acuminate and neither internally pectinate nor basally lobate. The four smooth-bodied Indian genera can, consequently, hardly be considered more than subdivisions of *Theronia*, Holmgr.

Mr. A. Roman, who has examined Thunberg's types at Upsala, is good enough to inform me that *Ichneumon gestator*, Thunb. (Bull. Ac. Sc. Petersb. 1822, p. 262), "is a ♀ of *Theronia* near *T. zebra*, Voll., but apparently another species"; and adds that *I. sanguinator*, Thunb. (*l. c.* p. 260)—also indicated by its author as Indian—is in reality synonymous with the South African Braconid, *Iphiaulax flagrator*, Gerst.

88. **Theronia clathrata**, *Krieg.*

Theronia clathrata, Krieger, Ber. Nat. Ges. Leipzig, 1899, p. 111 (♀).
Theronia areolata, Cameron,* Manch. Mem. 1899, p. 152 (♀).

♀. *Head* flavescent, with the frons centrally and the occiput (except near the eyes) brunneous; face centrally sparsely punctate, with the clypeus smooth; mandibular teeth black and palpi apically fulvous. *Antennæ* as long as the body, brunneous and becoming darker apically; scape flavescent beneath, with a lateral black line, sparsely punctate and with elongate pale pilosity. *Thorax* luteous, with the mesonotum brunneous, its sides and two central vittæ flavescent; metathorax nitidulous and impunctate; areola pyriform with its lateral carinæ basally broad and flat and apically acute and deeply excavate; the external areæ large, shallow and broader than long; petiolai area deeper, shorter and obliquely constricted towards the sinuate basal carinæ, distinctly discrete pro- and meso-pleuræ glabrous and nitidulous; metapleuræ also smooth and sharply carinate below the spiracles. *Scutellum* luteous, with its sides and apex flavous, impunctate and densely clothed with elongate, black pilosity; its basal fovea black and deeply impressed; postscutellum smooth and subglabrous, basally deeply bifoveate, laterally obliquely and acutely carinate, with the central partition triangular. *Abdomen* brunneous, with the base and apex of the first segment broadly, the apices of the second and third broadly, and of the fourth and fifth narrowly, flavous; basal segment acutely carinate laterally to a little beyond its centre, with the base and sides depressed obliquely beyond that point; terebra 3 millim. *Legs* stout, the hind coxæ and femora suffused with fulvous and their tarsi red. *Wings* fulvo-hyaline, with the stigma fulvous and nervures black; areolet oblique and emitting the recurrent nervure at its apical fourth.

Fig. 31.—*Theronia clathrata*, Krieg.

Length 12–13 millim.

ASSAM: Khasi Hills (*Rothney*).

Type of Cameron's species in the British Museum.

No doubt, I think, can be entertained respecting the synonymy of these two species, although Krieger describes the metanotal areola as twice as long as broad, laterally parallel, and emitting the costulæ distinctly beyond the centre; he adds that the face is broadly and longitudinally impressed, the frons centrally depressed, the scutellum somewhat convex, the notauli short and the terebra as long as the hind tibiæ.

89. **Theronia nigrobalteata**, *Cam.*

Theronia nigrobalteata, Cameron, Manch. Mem. 1899, p. 153 (♀).

♀. A fulvous species, with black markings, the wings apically infumate and the stigma pale. *Head* fulvous, with the face punctate throughout and flavescent above; clypeus glabrous and the mandibular teeth black. *Antennæ* stout and brunneous, becoming darker towards their apices, with the scape paler. *Thorax*: mesonotum piceous with its sides and two central vittæ flavous, the scutellar fovea and lines near the tegulæ black; metathorax basally black, widened laterally to the apex of the spiracles; areola deplanate and subquadrate, the external areæ longer than broad and apically constricted; central carinæ indistinct and the lateral stronger; pro- and meso-pleuræ smooth and shining, with the apex of the former narrowly, a longitudinal line beneath the radix, and an oblique line extending to base of the coxæ, black. *Scutellum* fulvous, with its apex broadly black and the sides flavescent; postscutellum flavous, with large basal foveæ. *Abdomen* rufescent with the segmental apices flavous; three basal segments basally black, the remainder broadly black apically; petiolar fovea shallow and extending to the apex; second segment longitudinally canaliculate basally in the centre, and laterally obliquely incised; terebra 3 millim. *Legs*: anterior pairs flavous, with their femora, and the intermediate tibiæ and tarsi, fulvescent: hind coxæ broadly black internally at the base, their trochanters apically, femora broadly in the centre, and the tibiæ, red; their tarsi infuscate. *Wings* hyaline, with their apices infumate; stigma testaceous; areolet oblique, laterally coalesced above and emitting the recurrent nervure shortly beyond the centre.

Length 10 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

"Comes near to *T. areolata*, but is smaller; has the thorax and abdomen marked with black, and otherwise may be known by the central area on the base of the median segment [metathoracic areola] being square and not hollowed" (*Cameron*, loc. cit.).

90. **Theronia iridipennis**, *Cam.*

Theronia iridipennis, Cameron, Tijds. Ent. 1907, p. 99 (♂).

♂. A pale flavous species, smooth and shining, with "a broad line on the centre of the apex behind black." *Head* with the face densely covered with elongate white pubescence. *Antennæ* ferruginous, with the scape flavous beneath. *Thorax*: mesonotum with three broad infuscate lines; a black line throughout the mesopleuræ immediately below the radix and a similar one, curving forwards below, on the lower half of their apices; metathorax with a straight oblique slope and dense elongate white pubescence;

the basally black areola large, quadrate and apically incomplete; lateral areæ nearly entirely black, distinctly longer than broad and slightly constricted towards their apices, which are broadest externally; external spiracular carinæ narrow and curved. *Abdomen* with a broad irregular band before the clear flavous apex of the basal segment, and the bases of the remaining segments broadly black. *Legs*, and especially the posterior, stout and covered with white pubescence; the greater part of the hind coxæ externally, and the underside of their trochanters and femora, black; hind femora also with a long inner and shorter outer infuscate discal line. *Wings* hyaline, highly iridescent, with distinct prismatic reflections; areolet oblique, with the sides approximating though not coalescent above, emitting the recurrent nervure from its apical fourth part.

Length 12 millim.

Sikkim (*Bingham*).

Unknown to me.

91. **Theronia gracilis**, *Cam.*

Theronia gracilis, Cameron, Manch. Mem. 1899, p. 154 (♀).

♂ ♀. *Head* with the mandibular teeth black, and the clypeus glabrous and apically sinuate. *Antennæ* brunneous and darker apically; scape flavescent beneath with dense and elongate infuscate pilosity. *Thorax*: mesonotum brunneous, with its sides and two discal stripes flavous; propleuræ apically, and mesopleuræ below, a band beneath the radices, an oblique band to the apex of the intermediate coxæ and a mark above them, black; metathorax basally, and its external areæ entirely, black; areola laterally straight, apically obsolete, with the basally open petiolar area straight and oblique. *Scutellum* not strongly elevated, laterally carinate above, rufescent, with its base flavous and the apex black; postscutellum basally rounded and constricted, laterally stoutly and obliquely carinate; the scutellar basal fovea and a semicircular mark at its apex, with others above the hind radices, black. *Abdomen* with the centre of the five basal, and the base of the two following, segments transversely black; basal segment laterally black in the centre with its central furrow broad and deeply impressed, as also are those on either side of the second; terebra 3 millim. *Legs* with the anterior femora slightly and the hind ones nearly entirely fulvous; hind coxæ externally at the base black and their tarsi nigrescent. *Wings* hyaline throughout, with the costa and stigma rufescent; nervures black; areolet oblique and not emitting the recurrent nervure beyond the centre.

Length 9–10 millim.

Assam: Khasi Hills (*Rothney*, type). Madras: Bangalore (*Cameron*, Ind. Mus.).

Type in the Oxford Museum.

"A smaller and more slender species than *T. nigrobalteata*, with which it agrees in having the abdominal segments banded with black; but it differs in having the central area on the base of the median segment [metathoracic areola] open at the apex; the lateral area shorter and broader at the apex; the petiole longer compared with the second segment; the wings not infuscated at the apex; the areolet slightly larger and receiving the recurrent nervure in the middle . . . . if anything, before the middle" (*Cameron*, loc. cit.).

92. **Theronia maskeliyæ**, *Cam.*

Theronia maskeliyæ, Cameron,* Spolia Zeylanica, 1905, p. 133 (♂ ♀).

♂ ♀. A pale flavous species, smooth and nitidulous, with black markings and short white pubescence. *Head* with only the ocellar region, and a curved occipital line, black. *Antennæ* stout and as long as the body, black, with the flagellum basally infuscate and the scape beneath flavous. *Thorax*: mesonotum black, with two discal stripes and the lateral margins flavous; metanotum flavous, with its base, centre narrowly, sides broadly, and a large apically constricted and basally incised mark at its apex, black; lateral areas longer than broad and apically constricted, basal area wanting, lateral carinæ straight and oblique, the spiracular curved, extending to apex and forming a single area from base to apex of metathorax, which is basally constricted by the lateral areæ. *Scutellum* flavous, with or without a central apically dilated black mark. *Abdomen* with all the segments broadly black basally; terebra fully a quarter the length of the body (3 millim.). *Legs* with all the femora broadly black-marked above; intermediate tibiæ infuscate behind, the hind ones with their base and a broad band nigrescent; posterior tarsi also nigrescent. *Wings* clear hyaline, with the nervures and stigma black.

Length 10 millim.

SIKKIM (Ind. Mus.); CEYLON: Maskeliya, iv. 1902, Kandy, viii. 1902 (*E. E. Green*); TENASSERIM, Mergui (*Doherty*, Ind. Mus.).

Type in the British Museum.

This is said to be a variable species, with respect to the extent of the black markings. "The scutellum may have no black mark; the size of the black lines on the legs varies, that on the hind femora may be cleft, wholly or in part; the pleuræ may be marked with black and, as is the case with many PIMPLIDES, there is a considerable variation in size," which is not indicated. This species closely resembles my *Orientotheronia maculipes*, but may at once be distinguished by its lack of metathoracic apophyses.

Genus **LISSOTHERONIA**, *Cam.*

Lissotheronia, Cameron, Spolia Zeylanica, 1905, p. 139.

GENOTYPE, *L. flavipes*, Cam.

Eyes large and internally emarginate; cheeks short. Antennæ slender and longer than the body, with the apical joint nearly as long as the two preceding united. Metathorax strongly, closely, and transversely striate, but with no longitudinal carinæ and consequently no areæ; spiracles about thrice as long as broad and broader below than above. Abdomen with the segments broader than long, entirely glabrous, nitidulous and impunctate with the first basally bituberculate. Tarsi thickly spinose, with the claws simple. Transverse median nervure received beyond the transverse basal; inner cubital nervure broadly rounded, with no nervelet; first recurrent of hind wings intercepted distinctly above its centre. Clypeus apically obliquely depressed and basally distinctly discrete from the face.

Range. Ceylon.

"This genus might be mistaken for a *Pimpla*, from which, however, it can be readily known by the perfectly smooth, shining abdomen. In Dr. Ashmead's system it would come in near *Allotheronia*, which may be known from it by the metathorax having a strong transverse apical area, with the upper angles dentate or tuberculate, the whole thorax, too, being 'closely, finely, rugosely punctate' except for a spot on the middle of the mesopleuræ. It has the metanotum closely transversely striated, as in *Lissopimpla*, having also the smooth abdomen of that genus; but otherwise is readily separated from it by the absence of parapsidal furrows and of a tooth on the hind femora" (*Cameron*, loc. cit.). The lack of all metathoracic areæ will at once separate it from the allied genera *Theronia*, *Orientotheronia*, and *Erythrotheronia*, which are probably little more than sections of a single genus.

93. **Lissotheronia flavipes**, *Cam.*

Lissotheronia flavipes, Cameron, Spolia Zeylanica, 1905, p. 139 (♀).

♀. A black species and distinctly nitidulous, except upon the metathorax which is closely striate, the pleuræ more closely and obliquely so than the disc; sternum with dense fulvous pubescence. *Head* with the face closely punctate, with the sides of the lower part roundly convex; clypeus apically depressed, smooth and shining, with the raised upper part sparsely punctate. A spot on the centre of the *scutellum*, and a curved one on the postscutellum, flavous. *Abdomen* with the terebra fully a quarter the length of the body (4 millim.). *Legs* flavous, with the front coxæ centrally below, and the posterior coxæ and trochanters entirely, black;

underside of coxæ with dense fulvous pubescence; tarsi spinose and much longer than the tibiæ. *Wings* flavescent hyaline, with a flavous dot at base of tegulæ.

Length 15 millim.

Ceylon: Pundaluoya (*E. E. Green*).

Unknown to me.

Genus **ORIENTOTHERONIA**, gen. nov.

Genotype, *O. rufescens*, sp. n.

Clypeus truncate at base and apex; labrum not exserted; mandibular teeth of equal length; cheeks obsolete; eyes deeply emarginate internally. Antennæ stout. Mesonotum not transversely strigose, with obsolete notauli; metathoracic areæ strongly carinate, with only the apex of the areola weak; basal area wanting, petiolar entire; apophyses strongly but obtusely dentate; spiracles linear and not small. Scutellum not convex, with its lateral carinæ narrow and not extending beyond the centre. Abdomen impunctate, obsoletely alutaceous; basal segment not carinate, the second in ♀ transverse; terebra shorter than abdomen. All the femora subincrassate, the anterior canaliculate but not toothed beneath; claws simple, neither pectinate nor basally lobate. Areolet entire and sessile; stigma narrow; median nervure of hind wing pellucid at the base; nervellus emitted above centre.

Range. India, Burma, Ceylon, China.

This genus is closely allied to both *Lissopimpla*, Kriech., and *Allotheronia*, Ashm. (Proc. U. S. Nat. Mus. 1900, p. 55); but it has neither the dentate femora and deeply impressed notauli of the one, nor the "metathorax exareolated but with a strong transverse apical area" and the basally entire median nervure of the other, which is known only by a single MS. species from New Zealand.

Table of Species.

1 (4) Nervelet wanting; first segment basally constricted.

2 (3) Hind tibiæ and antennæ red; radius subsinuate .... *rufescens*, sp. n., p. 146.

3 (2) Hind tibiæ with black markings, antennæ black; radius nearly straight .... *maculipes*, sp. n., p. 148.

4 (1) Nervelet distinct; first segment subparallel-sided throughout .... *acheron*, sp. n., p. 149.

94. **Orientotheronia rufescens**, sp. n.

♂ ♀. A tawny species, with black and flavous markings. *Head* flavous and not strongly narrowed nor abruptly declivous behind the eyes; occiput obsoletely punctate, bordered and black below; ocelli and scrobes black, the latter not small; face apically

narrowed, distinctly and somewhat strongly punctate and pilose; clypeus smoother, convex and truncate at the base and apex, strongly transverse, with the labrum not exserted; mandibles stout and punctate, with the apical teeth of equal length, short, strongly obtuse and black; cheeks obsolete, eyes strongly emarginate next the scrobes. *Antennæ* nearly as long as the body, a little attenuate basally, ferruginous throughout, with the scape flavous beneath; basal flagellar joints cylindrical and not elongate, hardly twice as long as broad. *Thorax* flavous and obsoletely punctate; mesonotum with longitudinal central and lateral ferruginous marks on the disc and a curved black line beneath the radices; metathorax apically ferruginous, with the external areæ entirely and determinately black; lateral areæ strong, areola a little narrowed basally and weakly truncate apically; apophyses distinct but obtuse, spiracles linear and not small. *Scutellum* and postscutellum obsoletely punctate, not convex, with the apex of the former piceous, and its lateral carinæ narrow and not extending beyond the centre. *Abdomen* subfusiform, ferruginous, hardly reticulate and strongly nitidulous; all the segments centrally black on the distinct and transverse tubercles, with a flavous transverse line before their apices; basal segment distinctly longer than broad, flavous, with a determinate central black or castaneous fascia which is medially impressed; terebra black, obsoletely pilose and half the length of the abdomen. *Legs* flavous, with the anterior femora canaliculate beneath; hind coxæ and apices of trochanters, and the posterior femora beneath, black, the latter above (as well as whole of their tibiæ) castaneous and their tarsi infuscate; claws strongly curved, somewhat slender, not basally lobate nor extending beyond the pulvilli. *Wings* siliceous and not clouded; radix and tegulæ flavous, latter apically castaneous; costa and the very narrow stigma piceous; radial nervure somewhat straight above the oblique and sessile areolet, which emits the recurrent nervure slightly beyond its centre; first recurrent of the lower wings strongly postfurcal, emitting the nervellus from its upper third.

Length 9–12 millim.

There is usually a black mark before the scutellum and a black line down the base of the mesopleuræ; the areola is often marked with black, but the abdominal tubercles are not infrequently no darker than the disc, and in one or two cases I have seen the three mesonotal stripes purely rufescent; the sinuation of the exterior radius appears variable, being much stronger above the areolet in specimens which have the stigma testaceous.

The male differs only in its more elongate and narrower abdomen.

SIKKIM, 1800 ft. and 4000 ft. (*G. C. Dudgeon*, *Bingham*); ASSAM: Khasi Hills; BURMA: Rangoon (type) and Mandalay (*Bingham*), Palon and Shwegu-myo (*Fea*). HONG-KONG.

Type in the British Museum.

95. **Orientotheronia maculipes**, sp. n.

♂ ♀. A flavous and black species, with fusiform abdomen. *Head* flavous and not strongly narrowed or abruptly declivous behind the eyes; occiput obsoletely punctate, bordered and black below, the colour centrally coalescent with that of the ocelli; scrobes somewhat large and centrally black; face apically narrowed, distinctly and not strongly punctate and pilose; clypeus smoother, a little convex and truncate at the base and apex, strongly transverse with the labrum not exserted; mandibles stout and punctate with the apical teeth of equal length, short, black and somewhat obtuse; cheeks obsolete, eyes strongly emarginate next the scrobes. *Antennæ* almost as long as the body, a little attenuate basally, black, with only the base paler beneath; flagellar joints cylindrical and not elongate, hardly twice as long as broad. *Thorax* stramineous and obsoletely punctate; mesonotum with longitudinal central and lateral black marks on the disc, a callosity beneath the radix, mesopleuræ in front and inferiorly behind, black; metathorax glabrous, with the external areæ and the base of the strongly transverse and apically obsolete areola black; lateral costæ strong, apophyses weak, spiracles linear and not small. *Scutellum* and postscutellum immaculate, obsoletely punctate, a little convex, with the lateral carinæ narrow and hardly extending beyond the centre. *Abdomen* fusiform, hardly punctate and strongly nitidulous; flavous, with the apices of the basally entirely black segments rufescent or testaceous; tubercles distinct and transverse; basal segment fully half as long again as apically broad, with a determinate and centrally canaliculate black fascia; terebra three-fifths the abdominal length, black and obsoletely pilose. *Legs* stramineous, with the anterior femora canaliculate beneath; all the femora longitudinally nigrescent above, as also are the tibiæ at the base and internally at the apex; posterior tarsi infuscate, hind coxæ internally and externally black-dotted, apices of their trochanters and a spot below the hind femora black; claws strongly curved, somewhat slender, not basally lobate nor extending beyond the pulvilli. *Wings* siliceous and not clouded; radix and tegulæ flavous, the latter apically darker; costa and the narrow stigma piceous; radial nervure almost straight above the oblique and sessile areolet, which emits the recurrent nervure slightly beyond its centre; first recurrent of the lower wings strongly postfurcal, emitting the nervellus from its upper third.

Fig. 32.
Orientotheronia maculipes, Morl.

Length 8–11 millim.

PUNJAB: Kangra Valley, 4500 ft., x. 99 (*G. C. Dudgeon*); BOMBAY: Poona, viii. 86 (*R. C. Wroughton*); CEYLON: Pundaluoya (type ♀), Kitli Otu, 21. ii. 92 (*Col. Yerbury*, type ♂), Kandy, vi. 06, and Sigriya, v.–vii. 09 (*E. E. Green*); TENASSERIM: Mergui (*Doherty*—Ind. Mus.). SINGAPORE (*H. N. Ridley*).

Types in the British Museum.

Closely allied to the last species, but at once recognised by its black antennæ and black-marked hind tibiæ; distinctly banded abdomen, which is much less rufescent; and the uniformly straighter radius; the average size is smaller and the abdomen distinctly narrower towards its base. It has much the facies of a *Nomada*.

96. **Orientotheronia acheron**, sp. n.

♂. A stramineous species with profuse black markings, the head posteriorly constricted, the basal segment subquadrate and the nervelet distinct.

Length 8 millim.

There can be no doubt that a single male I have seen is abundantly distinct from both the preceding species, since the basal abdominal segment is very much shorter and stouter, hardly longer than apically broad, the head narrower behind the eyes, the nervelet distinct and the whole facies obviously more "squat" and compact. In its markings and sculpture, however, it exactly corresponds with the male of the last-described species.

CEYLON: Pundaluoya (*Bingham*).

Type in the British Museum.

Genus **ERYTHROTHERONIA**, *Cam.*

Erythrotheronia, Cameron, Spolia Zeylanica, 1905, p. 134.

GENOTYPE, *E. flavolineata*, Cam.

Temples moderately large, obliquely narrowed; eyes incised, but not deeply, on the inner side; malar space almost absent. Last joint of antennæ shorter than the preceding two united. Metathorax areolated, not toothed; the spiracles longer than wide. Scutellum raised, stoutly keeled laterally to near the apex. Abdomen smooth, without furrows. Legs stout; the claws large, edentate. Areolet oblique, 5-angled; the transverse median nervure interstitial; transverse median nervure in hind wings broken distinctly above the middle.

The bold and constant sanguineous coloration is quite distinctive.

Range. Ceylon.

"The type of this genus looks like a red *Xanthopimpla* or *Theronia*. In Dr. Ashmead's system it comes near to the New Zealand genus

Allotheronia, from which it differs in the regularly areolated, not dentate, median segment. *Theronia* and *Neotheronia** differ, *inter alia*, in having pectinated claws" (*Cameron*, l. c.). At first I thought this genus possibly synonymous with my *Orientotheronia*, but it is very obviously distinct in the non-dentate metathorax, elevated scutellum, which is laterally margined to near its apex, and the but slightly emarginate eyes.

At present we know but a single species, from Ceylon.

97. Erythrotheronia flavolineata, *Cam.*

Erythrotheronia flavolineata, Cameron, Spolia Zeylanica, 1905, p. 134, pl. B, fig. 12 (♂ ♀).

♂ ♀. A ferruginous, glabrous and nitidulous species, with the antennæ alone black. *Head* with the cheeks, palpi, mandibles, clypeus, the external orbits apically, and the sparsely but distinctly punctate face (which is laterally elevated) flavous. *Antennæ* black, with the scape flavous, and the flagellum piceous, beneath. *Thorax* nitidulous and impunctate, the mesonotum with dense infuscate pubescence; lower half of the propleuræ, two mesonotal stripes and its sides at the base, petiolar area and the metapleuræ except above, flavous; metanotal areæ complete, areola twice as long as broad, with the external and dentiparal areæ broader than long, the former the longer, with its carina apically rounded, the latter broadest externally; spiracular areæ and petiolar area large, posterior areæ subtriangular. *Scutellum* apically, its basal carinæ and the whole postscutellum, flavous. *Abdomen* nitidulous and impunctate; apices of all the segments flavous; terebra one-fifth the length of the body (3 millim.). *Legs* ferruginous, with the anterior coxæ, and all the trochanters, flavous. *Wings* hyaline and highly

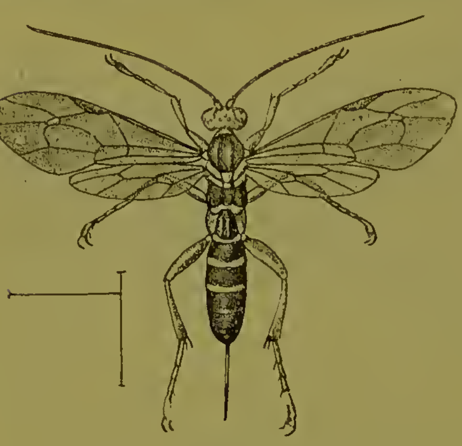

Fig. 33.
Erythrotheronia flavolineata, Cam.

* This genus appears to be confined to Tropical America, so far as is at present known, and to comprise numerous species, several of which were described by Cresson (Proc. Acad. Nat. Sc. Philadelphia, 1873) and many more by Krieger (*cf.* the latter's very excellent papers in Ber. Nat. Ges. Leipzig, 1899, and "Ueber die Ichneumonidengattung *Neotheronia*, Kr." in Zeits. Hym.-Dip. 1905, pp. 286–333).

iridescent, with a slight infumate-violaceous reflection; tegulæ internally flavous, stigma testaceous and nervures black.

Length 12–14 millim.

CEYLON: Kandy, vii. and ix. (*E. E. Green, O. S. Wickwar*).

No mention is made of the disposition of the wing-nervures in the above description, but from the figure (*l. c.*) it seems evident that the areolet is remarkably transverse and fully twice as broad as high, emitting the recurrent nervure from slightly before its apex; the radius is bisinuate, above the areolet and a little before its apex; the basal nervure is poorly figured; nor does it appear clear whether the nervellus is emitted at, or distinctly a little above, the centre of the obviously postfurcal first recurrent of the hind wing; the figure given by Cameron is that of the ♂. In my females all these points are correct, the basal nervure is continuous through the median, and the nervellus is intercepted very distinctly above its centre.

Superficially this species has much the facies of a pale *Echthromorpha*.

Genus **PIMPLA**, *F.*

Pimpla, Fabricius, Piez, 1804, p. 112.

GENOTYPE, *Ichneumon instigator*, F.

Head transverse, short and broad, somewhat narrowed behind the usually slightly emarginate eyes; frons subimpressed, shining, centrally a little concave, with the scrobes large; clypeus basally distinctly discrete, towards the apex strongly depressed, and not emarginate apically; labrum but slightly exserted; mandibles apically attenuate, with the teeth of equal length. Antennæ filiform and in ♀ very slender; scape strongly excised externally and in ♂ often pale beneath. Thorax stout and convex, often pilose and shining; notauli usually obsolete; metathoracic areæ never entire, usually the lateral alone traceable; spiracles not circular. Scutellum not strongly convex; often pale. Abdomen broadly sessile and usually wider in the middle; first segment excavate at the base and, at least there, carinate, with the spiracles before the centre; remaining segments usually distinctly broader than long, especially in the ♀, with the surface strongly punctate, distinctly uneven, laterally tuberculate, transversely impressed before the subelevated apices; two apical ventral segments of ♀ divided for the passage of the terebra, which is always exserted, though never longer than the abdomen. Legs not unusually short or stout; tarsal claws simple, neither lobate nor pectinate. Wings with the areolet complete and subtriangular; nervellus always intercepting the first recurrent of the lower wing above its centre.

Range. Both hemispheres.

Table of Species.

1	(2)	Scutellum sulcate; all abdominal segments apically flavescent	*latisulcata*, Cam., p. 153.
2	(1)	Scutellum not sulcate; abdominal segments not or hardly pale.	
3	(4)	Coxæ flavous; abdomen mainly brunneous	*bicarinata*, Cam., p. 153.
4	(3)	Coxæ at least partly, and the abdomen, black or blue.	
5	(8)	Basal abdominal segment obsoletely reticulate; tarsi pale throughout.	
6	(7)	Mesopleuræ and abdomen finely punctate; tegulæ pale	*ampla*, sp. n., p. 154.
7	(6)	Mesopleuræ and abdomen entirely impunctate; tegulæ black	*taprobanæ*, Cam., p. 155.
8	(5)	Basal segment distinctly punctate; tarsi mainly nigrescent.	
9	(26)	Areolet normal; face and pronotum immaculate black.	
10	(15)	Hind femora and most of tibiæ unicolorous red.	
11	(14)	Frons with central impressed line; hind tarsi black.	
12	(13)	Apices of hind tibiæ not black	*instigator*, F., p. 156.
13	(12)	Apices of hind tibiæ distinctly black	*laothoë*, Cam., p. 158.
14	(11)	Frons with no impressed line; hind tarsi apically pale..............	*nepe*, Cam., p. 159.
15	(10)	Hind tibiæ black, rarely pale banded.	
16	(21)	Hind tibiæ not or but obsoletely pale-banded.	
17	(18)	Face not strongly punctate; metathorax subrugulose	*arctica*, Zett., p. 160.
18	(17)	Face strongly punctate; metathorax trans-striate.	
19	(20)	All the femora red; abdomen dull blue-black	*indra*, Cam., p. 161.
20	(19)	Hind femora black; abdomen bright metallic blue	*cyanea*, sp. n., p. 162.
21	(16)	Hind tibiæ broadly and conspicuously pale-banded.	
22	(23)	Frons trans-aciculate; front tibiæ pale-banded	*turionellæ*, L., p. 163.
23	(22)	Frons not trans-aciculate; front tibiæ unicolorous.	
24	(25)	Hind femora red; frons coarsely punctate; metathorax punctate ..	*himalayensis*, Cam., p. 164.
25	(24)	Hind femora black; frons subglabrous; metathorax trans-strigose ..	*apollyon*, sp. n., p. 165.
26	(9)	Areolet broad; face or pronotum marked with flavous.	
27	(28)	Face flavous; pronotum and abdomen immaculate	*latifoveata*, Cam., p. 166.
28	(27)	Face black; pronotal and abdominal marks flavous	*lætiventris*, Cam., p. 168.

Pimpla sagræ, Voll., is recorded from "India" by Dalla Torre (Cat. Hym. iii. p. 448); but its author describes both sexes (Stett. Ent. Zeit. 1879, p. 149) from Java only, and I have heard of no subsequent records.

98. **Pimpla latisulcata**, *Cam.*

Pimpla latisulcata, Cameron, Zeits. Hym.-Dip. 1908, p. 40 (♂).

♂. Black. *Head* glabrous and nitidulous, with only the face and clypeus closely and strongly punctate, densely and somewhat elongately infuscate-pilose. *Thorax*: pro- and mesothorax nitidulous, sparsely and obsoletely punctate; metapleural carinæ strongly and closely punctate, densely white-pilose. *Scutellum* black, more strongly punctate than the mesonotum, centrally longitudinally sulcate throughout and less broadly towards its apex. *Abdomen* more than twice as long as the thorax, strongly and rugosely punctate, most strongly on the basal segments, with the basal segmental impressions crenulate; apex of basal segment with a short central line, and narrow lines at the apices of the second to sixth, rufo-flavous. *Legs*: anterior pairs pale fulvous, with their coxæ and trochanters flavous; hind legs red with the tibiæ darker below and paler above, and their tarsi black. *Wings* hyaline and strongly iridescent, with the nervures and stigma black; areolet broad above, emitting the recurrent nervure from its apical fourth; transverse median nervure pellucid.

Length 12 millim.

SIKKIM (*Bingham*).

The peculiar conformation of the scutellum should at once distinguish this species, which I have not seen, from all the other PIMPLIDES; the pale-marked abdomen relates it somewhat to the genus *Exeristes*, Först.

99. **Pimpla bicarinata**, *Cam.*

Pimpla bicarinata, Cameron, Manch. Mem. 1899, p. 171 (♀).

♀. A black species with the abdomen and mouth brunneous, the legs mainly flavous and the wings hyaline. *Head* black; face sparsely punctate, with somewhat elongate infuscate pilosity; epistoma obtusely carinate; clypeus, labrum and mandibles brownish and nitidulous, with the teeth black; palpi pale flavous; frons and vertex glabrous and nitidulous, the former but little deplanate. *Antennæ* black, with the scape thickly and elongately white-pilose. *Thorax* glabrous and nitidulous, immaculate black; mesonotum densely and elongately white-pilose; metathorax strongly and uniformly punctate, with the glabrous central area straightly and distinctly carinate and apically divergent; pro- and meso-pleuræ glabrous and nitidulous, sparsely and somewhat

elongately pale-pilose, with the latter apically impressed and deepest at the extreme apex, which is inferiorly crenulate; metapleuræ basally not deeply impressed, with the base and the areæ below the lateral carinæ glabrous, and the lateral areæ strongly punctate. *Scutellum* sparsely and shallowly punctate; postscutellum closely punctate. *Abdomen* brunneous, with the basal segment between its centre and apex, and the apices of the four following segments narrowly, black; first segment with the basal fovea, the sides near the centre, the apex and a broad oblique band on either side of it, glabrous; the remaining segments closely and strongly punctate, but more obsoletely towards the anus; third and fourth segments deeply and broadly impressed transversely before their apices; venter with the basal segment black and the remainder fulvo-testaceous; terebra not quite half the length of the body, with the valvulæ strongly pilose. *Legs* flavous, with the hind femora, tibiæ and tarsi fulvous. *Wings* clear hyaline, with the nervures and stigma black; areolet elongate, oblique and shortly petiolate, with its internal nervure straight and the external curved; recurrent nervure emitted from very near the apex of the areolet.

Length 10 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

100. **Pimpla ampla**, sp. n.

♂ ♀. A black species, with the tibiæ and femora entirely bright citrinous, the scutellum white and the wings subflavescent. *Head* of normal breadth behind the very slightly emarginate eyes, with the occiput finely punctate and bordered; frons subconcave and, except centrally, finely punctate; face more rugosely punctate with somewhat elongate fulvous pilosity, longitudinally impressed on either side of the epistoma; clypeus truncate at its transversely impressed and subglabrous apex, as well as at its convex and punctate base; mandibles immaculate and not broad, palpi infuscate and the cheeks very short. *Antennæ* filiform and slender, a little shorter than the body and immaculate, with the basal flagellar joints cylindrical and strongly elongate. *Thorax* obsoletely and confluently punctate, with the petiolar area and specular region subglabrous; notauli short and

Fig. 34.—*Pimpla ampla*, Morl.

superficial, mesonotal pubescence short and fulvous; metathorax basally trans-aciculate, with no areæ and only the lateral costæ traceable; spiracles broadly ovate, apophyses wanting. *Scutellum* and postscutellum, except apically, bright stramineous, deplanate, with infuscate pilosity but no border. *Abdomen* of ♂ cylindrical and parallel-sided, of ♀ elongate fusiform; nitidulous and obsoletely punctate, black, with the extreme apices of the four basal segments indefinitely badious; basal segment nearly twice as long as apically broad, subglabrous, centrally elevated and shallowly canaliculate to near its apex; the following three subtransverse, with obsolete lateral tubercles and the apical ones becoming more transverse; venter black, valvulæ not exserted; terebra half the length of the abdomen, spicula black. *Legs* slender and not short, pale flavous, with only the coxæ and posterior trochanters black; tarsal claws slender, curved, not basally lobate nor extending beyond the pulvilli, with the apical half alone black. *Wings* ample, slightly and evenly flavescent throughout; radix and tegulæ stramineous; costa and stigma piceous, the latter internally ferruginous; areolet not small, oblique, sessile and emitting the recurrent nervure from its apical third; radius straight; first recurrent of lower wing strongly postfurcal, emitting the nervellus from its upper third.

Length 8–16 millim.

Ceylon: Horton Plains, 6500 ft., v. 02 (*Bingham*, type), Maskeliya, iii. 09 (*F. Bainbrigge Fletcher*), Ohiya, 6000 ft., viii. 06, and Agrapatnas, xii. 09 (*O. S. Wickwar*), Namunakule, 6600 ft., ii. 10 (*E. E. Green*).

Type in the British Museum.

This species is closely allied to *P. instigator*, F., but the whole sculpture is finer and much more strongly nitidulous; the legs are conspicuously paler, substramineous, with the hind tarsi concolorous, the wings are decidedly flavescent and the metathoracic spiracles much broader.

101. Pimpla taprobanæ, *Cam.*

Pimpla taprolanæ, Cameron *, Manch. Mem. 1897, p. 21 (♀).

♀. Black with the legs flavous, the coxæ and trochanters black, and the wings fulvo-hyaline. "Head closely punctured, covered with a short white pubescence; the face projecting, at top forming almost a triangle; clypeus forming a semicircle at the top, where it is obscurely punctured; the apex almost perpendicular; the labrum piceous, fringed with long golden hair; palpi and mandibles entirely black. Pro- and meso-notum thickly covered with fuscous hair; obscurely shagreened; pro- and meso-pleuræ shining, impunctate, thickly covered with short whitish pubescence, and having a plumbeous tinge; the median segment [metathorax] broadly raised in the middle at the base; the centre raised; strongly, the sides finely transversely, striated; the centre at the

apex with an oblique slope; the sides rather acute at the top. A large square spot on the scutellum and a long one on the post-scutellum yellow. Abdomen entirely black; shining, impunctate; the petiole at the base depressed in the middle; oblique; its top somewhat triangularly, its sides much more widely, depressed; gastrocœli oblique, smooth, raised in the centre; and from them an oblique furrow leads to the apex of the [second] segment; the oblique furrows on the third segment moderately deep and wide; on the fourth they are shallower. Legs almost bare; the fore trochanters beneath and at the apex all round, yellow. Wings fulvo-hyaline; the stigma testaceous in the middle; the tegulæ black."

Length 13 millim.

CEYLON.

Type in the Oxford Museum.

The above description of Cameron's, though poor, is sufficient to show that this female is closely allied to his *Pimpla poesia*, which I consider nothing but an Oriental form of *P. instigator*, F. Therefrom *P. taprobanæ* may be at once known by the obsoletely punctate abdomen and pleuræ, in which it resembles the genus *Theronia*; the curiously and stoutly bituberculate basal segment is distinct from that of any other species of this genus known to me.

102. **Pimpla instigator**, *F.*

Ichneumon instigator, Fabricius, Ent. Syst. ii, 1793, p. 164 (♀); Panzer, Schæf. Ic. pl. cv, 1804, fig. 5 (♂).
Cryptus instigator, Fabricius, Piez. 1804, p. 85.
Sirex spectrum, Donovan, Brit. Ins. vii, pl. 225, figs. 1 & 2 (♀); *cf.* Stephens, Ill. Man. vii, p. 885.
Pimpla instigator, Gravenhorst, Ichn. Eur. iii, p. 216; Curtis, Brit. Ent. pl. ccxiv, figs. 1–5; Zetterstedt, Ins. Lapp. p. 375; Ratzeburg, Ichn. Forst. i, p. 886; id., iii, p. 99, pl. iv, fig. 1; Curtis, Farm Ins. p. 99; Holmgren, Sv. Ak. Handl. 1854, p. 87; id., *op. cit.* 1860, n. 10, p. 18: Taschenberg, Zeits. Ges. Nat. 1863, pp. 52 & 261; Thomson, Op. Ent. viii, p. 746 & xiii, p. 1408; Schmiedeknecht, Zool. Jahrb. 1888, p. 470 (♂ ♀).
Var. *P. intermedia*, Holmgren, Sv. Ak. Handl. 1860, n. 10, p. 19 (♂ ♀).
Var. *P. processionea*, Ratzeburg, *op. cit.* iii, p. 101 (♂); *cf.* Tosquinet, Ann. Soc. Ent. Belg. 1897, p. 283.
Var. *P. poesia*, Cameron, Manch. Mem. 1899, p. 176 (♀).

♂ ♀. A black species, with only the femora and the tibiæ red. *Head* transverse, somewhat short and strongly narrowed behind the eyes; frons concave and subexcavate, transversely aciculate, with a longitudinal central impressed line; clypeus basally elevated, strongly depressed towards the glabrous and subtruncate apex; eyes oblong-ovate and slightly emarginate next the scrobes; face strongly and evenly punctate, with long black pilosity, centrally convex, with a longitudinal and often subglabrous line; mandibles stout and coarsely punctate, margined below; palpi of ♂

stramineous, of ♀ with the three apical joints fulvous. *Antennæ* a little shorter than the body; of ♀ very slender, filiform throughout with the basal flagellar joints apically subnodulose and the first nearly half as long again as the second; of ♂ stouter, apically subattenuate, with the basal flagellar joints much shorter; flagellum sometimes dull ferruginous beneath, scape punctate. *Thorax* stout, gibbous, immaculate; mesonotum and mesosternum evenly punctate and nitidulous, with obsolete notauli; mesopleuræ strongly punctate and posteriorly strigose; metathorax subdeplanate and scabrous, with the areæ wanting, lateral carinæ stout and obtuse, and spiracles elongate-oblong. *Scutellum* deplanate, shining, glabrous, with sparse brown pilosity, black; in both sexes rarely more or less apically flavous. *Abdomen* black, of ♂ subcylindrical, of ♀ oblong-ovate, longer and hardly narrower than the head and thorax; first segment not carinate, basally excavate, centrally bituberculate in ♀, and apically subelevated; the four basal segments scabriculously punctate, with a subobsolete transversely impressed line and a small oblique basal impression on either side, apically shining and slightly elevated; the remainder smooth with no impressions; terebra hardly half the length of the abdomen, with the valvulæ shortly pilose. *Legs* somewhat stout but not short, red or fulvous; coxæ and trochanters black, with the latter sometimes apically red; hind tarsi except rarely basally, black; claws stout, curved, ferruginous, distinctly a little longer than the pulvilli, neither pectinate nor in ♀ lobate basally. *Wings* normal, sometimes more or less infumate; stigma and radix black, piceous or ferruginous, with the former always distinctly paler basally; tegulæ black, usually white-marked and in ♂ often entirely pale stramineous; areolet subsessile, somewhat transverse; the internal cubital sinuate, with no nervelet; nervellus strongly postfurcal and intercepting far above the centre.

Length 10–20 millim.

Punjab: Simla, 7000 ft., x. 07 (Pusa coll.), v. 97 and viii. 98 (*Col. Nurse*); Sikkim, 4000 ft., iv. 94 (*Col. Bingham*); Bengal: Pusa, iv. 07 (*B. Singh*); Assam: Shillong, v. 03 (*Rowland Turner*), Khasi Hills (*W. F. Badgley*, and Ind. Mus.); Madras: Bangalore (Ind. Mus.); Ceylon: Pundaluoya (*Bingham*), Pettipola, xii. 07 (*T. Bainbrigge Fletcher*). Europe.

This is an unusually constant species, apparently varying in nothing but size. The variety *intermedia* is very distinct in its constantly smaller size of about 9 millim., the frons less excavate, with the vertex more closely punctate, metanotum basally subcanaliculate, apices of abdominal segments always more or less rufescent, stigma hardly paler basally, and the eyes internally more deeply emarginate. It is very probably a good species, and I have seen but one female referable to it from Kashmir, 5000–6000 ft., May (*Col. Nurse*).

A very lucid account of the structure of this species, as illustrating that of the Ichneumonidæ in general, is given by Westwood (Introd. Mod. Classif. ii, p. 137; ii, p. 140) and it is well-figured by Van Vollenhoven (Pinac. pl. ix, fig. 1). The Oriental

specimens (*P. poesia*, Cam.) differ to only a very slight extent (mainly in their duller body) from the familiar European form; in the ♀, as well as in the ♂, the scutellum is usually, though not always, mainly flavous, the tegulæ are testaceous and the stigma, in all the examples of both sexes that I have seen, is clear fulvous. There can, however, remain no shadow of doubt that they are conspecific. I have seen the types of both sexes of *P. poesia* in the British Museum; the female lacks both antennæ.

One of the very commonest of the whole ICHNEUMONIDÆ throughout Europe, it is not surprising that this species should extend to the hill districts of India, though its occurrence in Ceylon is more remarkable. It is one of the first insects ever described, since it is recorded under the name *Musca bipilis secunda* by old Moufet, from the neighbourhood of Oxford as long ago as 1634 (Ins. Theatr. p. 63). Its parasitism is most probably confined to the Lepidoptera, as the only two records from TENTHREDINIDÆ require confirmation; upon the former it appears well-nigh omnivorous, attacking with impartiality every group and family. Nearly a hundred distinct species from which it has been bred are enumerated in my "Ichneumonologia Britannica" (iii, pp. 92–95), where also are given details of its economy so far as they were known in 1908. Its Indian hosts are at present unknown, although it appears to be as common in India as in Europe, and is represented in all the collections I have seen.

103. **Pimpla laothoë**, *Cam.*

Pimpla laothoë, Cameron, Manch. Mem. 1897, p. 22 (♀).

♂ ♀. A black species, with the scutellum immaculate and the legs mainly red. *Head* densely covered with fulvescent pilosity, which is especially elongate and thick below the scapes, where is a central nitidulous and impunctate line; frons broadly but not deeply impressed; front ocellus surrounded by a furrow, continued down the centre of the frons, which is shallowly punctate. *Antennæ* filiform and very slender, nearly as long as the body and black, with all the flagellar joints strongly elongate. *Thorax* immaculate, closely punctate and densely pilose; metathorax evenly declivous and laterally subcarinate, rugose and in the centre transversely strigose; propleuræ longitudinally strigose below and stoutly bicarinate longitudinally above;

Fig. 35.—*Pimpla laothoë*, Cam.

spiracles large and strongly elongate. *Scutellum* glabrous and nitidulous, shallowly and isolatedly punctate, laterally strongly and closely punctate; postscutellum rugosely punctate. *Abdomen* immaculate, closely and strongly punctate, with the segmental apices glabrous and nitidulous; first segment basally broadly impressed, smooth and subimpunctate, becoming distinctly punctate beyond the strong but short carinæ; terebra 3–5 millim. in length. *Legs* red, with all the coxæ and hind trochanters, the hind tarsi and apices of their tibiæ broadly, black; all the coxæ, tibiæ and tarsi densely fulvo-pilose. *Wings* fulvo-hyaline, with the nervures and stigma fulvous.

Length 13–17 millim.

UNITED PROVINCES: Mussoori (*Rothney*, type); MADRAS: Utakamand (Ind. Mus.).

Type in the Oxford Museum.

This is certainly a good species, closely allied to *P. instigator*, but instantly known by the narrower abdomen, more nitidulous and strongly bicarinate basal segment, strongly fulvescent wings and apically broadly black hind tibiæ. Probably rare, since the only specimen I have seen (which possesses entirely black hind femora, not noted by Cameron) did not come to hand till 1910.

104. Pimpla nepe, *Cam.*

Pimpla nepe, Cameron, Manch. Mem. 1897, p. 23, pl. iii, fig. 4 (♀).

♀. A black species with the legs mainly red. "Head closely and strongly punctured below the antennæ; the front widely depressed, impunctate, shining; the palpi dirty testaceous. Pro- and mesonotum strongly and closely punctured, thickly covered with short pale hair; median segment [metathorax] with a gradually rounded slope from the base to the apex; coarsely rugosely punctured; the centre broadly raised in the middle towards the apex; pleuræ and sternum punctured. The scutellum thickly punctured behind, more sparsely in front; the top with a pale orange mark; the postscutellum strongly longitudinally striolated. The petiole with a deep impunctate excavation at the base; the other segments closely and somewhat strongly punctured, except at the extreme apex; terebra 4 millim. All the coxæ and trochanters are black; the former on the lower side thickly covered with fulvous hair; the hinder tarsi black, except at the extreme apex.

"*Length* 13 millim.

"Almost identical in coloration with *P. laothoë*, but may be known from it by the absence of the furrow on the front and of the keels on the propleuræ; by the scutellum being more closely and strongly punctured and pale yellow in the centre."

UNITED PROVINCES: Mussoori (*Rothney*).

Type in the Oxford Museum.

The insect figured is undoubtedly a ♀ of the restricted genus

Pimpla, though the erroneously short terebra lends it somewhat the aspect of *Itoplectis curticauda*, Kriech. Both this and the preceding species appear remarkably closely allied to *P. instigator*.

105. Pimpla arctica, *Zett.*

Pimpla arctica, Zetterstedt, Ins. Lapp. p. 375 (♂); Holmgren, Sv. Ak. Handl. 1860, p. 19; Thomson, Op. Ent. xiii, p. 1408 (♂ ♀).
P. lapponica, Thomson (*nec* Zett.), *op. cit.* viii, p. 746.
P. spuria, Schmiedeknecht (*nec* Grav.), Zool. Jahrb. 1888, p. 477.

♂ ♀. *Head* short and somewhat strongly constricted behind the eyes; frons and face hardly nitidulous, the former transversely subrugulose, the latter shallowly punctate; palpi piceous. *Antennæ* long and slender, filiform and immaculate. *Thorax* black; mesonotum shining, finely and shallowly punctate; mesopleuræ finely, evenly and diffusely punctate, becoming subrugose below; metathorax strongly rugose-punctate, with the areola apically entire and laterally distinctly carinate; petiolar area basally rugose and apically nitidulous; metapleuræ closely and finely strigose; spiracles elongate. *Scutellum* immaculate (or apically flavous). *Abdomen* closely and coarsely punctate basally, more finely towards the nitidulous apex; tubercles obsolete; apices of the segments not broadly elevated and nitidulous, the apical ones often narrowly pale; terebra half the length of the abdomen, with the valvulæ shortly pilose. *Legs* red, with the coxæ black; hind tibiæ, often the femora, and at least the apices of the tarsi nigrescent, with their tibiæ usually narrowly pale-banded before the base. *Wings* a little clouded, with the fenestræ very distinct; stigma nigrescent, with its base somewhat pale; nervellus intercepting far above the centre of the first recurrent nervure.

Length 9–15 millim.

KASHMIR, 6000–7000 ft., v. 1901 (*Col. Nurse*); PUNJAB: Simla, 7000 ft. (*Col. Nurse*, v. 1897 and in Pusa coll. x. 1907).

In Europe it is an essentially northern species, common in Scandinavia but seldom met with in the central countries. As compared with European specimens, the Indian ♂ differs only in its distinctly paler stigma, while the apex of the scutellum is bright flavous in the ♀; both of which modifications have already been noted as obtaining in the eastern representatives of European species, under *P. instigator*.

This species is very like *P. turionellæ*, and especially its var. *strigipleuris*; but it is altogether stouter, with the hind tibiæ at most but narrowly pale-banded. I have seen no Oriental specimens with any trace of the pale band. From *P. instigator* it differs in having the face much more closely, and in the elevated centre confluently, punctate, with short grey pilosity; the palpi with at most the two apical joints paler, the scape more strongly

punctate beneath, the mesopleuræ not at all strigose, the scutellum much more finely punctate throughout; the hind legs mainly black, with the coxæ strongly and subconfluently punctate; the areolet externally pellucid and the internal cubital nervure less sinuate.

106. **Pimpla indra**, *Cam.*

Pimpla indra, Cameron,* Manch. Mem. 1899, p. 179 (♀).

♀. Metallic blue-black, with the femora and anterior tibiæ ferruginous. "The face strongly punctured; the clypeus with a row of larger, deeper and longer punctures; the front smooth, broadly depressed; the lower part quite smooth, the upper obscurely transversely striated in the middle. Antennæ black; the scape smooth, shining; the flagellum almost bare. Mesonotum shining, having a faint plumbeous hue: the basal two-thirds of the median segment [metathorax] strongly transversely striated, most strongly so in the middle; the apex in the middle smooth, slightly raised in the middle; the sides obscurely aciculated: the base of the propleuræ finely longitudinally striated; the lower two-thirds of the apical part rather strongly longitudinally striated: mesopleuræ coarsely punctured, the middle smooth above; the apex stoutly crenulated, the part over the middle coxæ coarsely striated: metapleuræ coarsely rugosely punctured; the apex more closely punctured than the base; the basal depression smooth in the middle, the sides roughly punctured. Scutellum at the base very shining, bearing only a few slight punctures; its apex rugosely punctured: postscutellum smooth, the depression at its sides wide, strongly longitudinally striolated. The central depression on the petiole smooth; the sides and apex roughly aciculated; the sides at the apex divided by a flat, oblique, raised part; in the centre above it is finely transversely striated, intermixed with large punctures: terebra 5 mm. Legs black; all the femora and the anterior tibiæ ferruginous; the anterior tarsi fuscous. Wings fulvo-hyaline, stigma and nervures black."

♂. The hitherto undescribed ♂ differs only in having the clypeus subglabrous and concave, the abdomen narrower and subcylindrical, the antennæ stouter and less filiform, and the wings less strongly fulvescent.

Length 10–15 millim.

Assam: Khasi Hills (*Rothney*, type), Shillong, 6000 ft., v. & ix. 1903 (*Rowland Turner*).

Type in the British Museum.

This species closely resembles *P. arctica*, but the face is more strongly punctate and the metathorax distinctly trans-strigose. Its author makes no mention of the very distinctive metallic blue reflection of the abdomen; it is certainly correctly ascribed to the restricted genus *Pimpla*, allied to *P. instigator*, though more slender, as I was enabled to note on examining the type

Mr. Rowland Turner tells me that during September 1903 the females of this species were attracted to the blossoms of a plant allied to our Meadowsweet (*Spiræa ulmaria*); his specimens go to show that the metallic reflection on the abdomen is of variable extent and in some examples almost wanting. My description of the ♂ is drawn from a single specimen from the North Khasi Hills, in the British Museum.

107. **Pimpla cyanea**, sp. n.

♀. A slender, brightly metallic blue species, with entirely black hind legs. *Head* immaculate black, with the vertex somewhat narrow and concave between the pale ocelli; frons strongly excavate, shining, subglabrous and obsoletely punctate, with the longitudinal sulcus obsolete; eyes distinctly emarginate next the glabrous scrobes; face coarsely and uniformly punctate, with sparse and elongate white pilosity and the epistoma very narrowly glabrous; clypeus deplanate, nitidulous and only centrally discrete, distinctly impressed before the elevated and subconcave apex; mandibles with the teeth subequal in length. *Antennæ* very slender, entirely black and nearly as long as the body. *Thorax* black, with a slight cyaneous reflection and a small flavous callosity immediately before the tegulæ; mesonotum with the notauli extremely obsolete and the recumbent pubescence griseous; metathorax trans-strigose throughout, with only the undefined petiolar area smoother; lateral costæ strongly elevated above the elongate spiracles; mesopleuræ nitidulous and distinctly punctate. *Scutellum* elevated, very shining, with erect pilosity and sparse punctures. *Abdomen* not broader than the thorax and broadest behind the centre, nitidulous metallic blue, with the central segments very finely trans-aciculate, the two basal ones with sparse and very distinct punctures; basal segment hardly as long again as apically broad and distinctly margined in the angles; anus glabrous, with the extreme apex brown; terebra somewhat stout, hardly longer than half the abdomen, with the spicula dark red and the pilose valvulæ black. *Legs* of normal length and not stout, black, with the anterior tibiæ (at least internally), the front tarsi and the inner side of their femora, testaceous; hind tarsi with the fourth joint half the length of the third, the apical as long as both, and the claws large, though not basally lobed. *Wings* ample and siliceous, with the tegulæ, nervures and stigma black, radix and extreme base of stigma testaceous; areolet somewhat small and hardly petiolate, emitting the recurrent nervure from its apical third; inner cubital centrally sinuate, with no nervelet; radial not sinuate above the areolet; nervellus emitted from the upper third of the strongly postfurcal recurrent nervure.

Length 12 millim.

Sikkim, 4000 ft., iv. 1894 (*Col. C. T. Bingham*).

Type in the British Museum.

The remarkable metallic coloration of this beautiful species exceeds that of the most pronounced forms of *P. indra*, from which the colour of the femora will instantly distinguish it. I know no other metallic Indian species in the genus.

108. **Pimpla turionellæ**, *L.*

Ichneumon turionellæ, L., Faun. Suec. 1761, p. 404.
Cryptus turionellæ, F., Syst. Piez. 1804, p. 87.
Pimpla turionellæ, Gravenhorst, Ichn. Eur. iii, p. 192; Thomson, Opusc. Ent. viii, p. 747; Zetterstedt, Ins. Lapp. p. 367; Ratzeburg, Ichn. Forst. i, p. 883; Holmgren, Sv. Ak. Handl. 1860, n. 10, p. 21; Taschenberg, Zeits. Ges. Nat. 1863, p. 53; *cf.* Vollenhoven, Pinac. pl. ix, fig. 7 (♂ ♀).
Var. *P. strigipleuris*, Thomson, *l. c.*; id., *op. cit.* xiii, p. 1408; id., *op. cit.* xix, p. 2125 (♂ ♀).
Var. *P. flavicoxis*, Thomson, *op. cit.* viii, p. 747; id., *op. cit.* xiii, p. 1408 (♂ ♀).
Var. *Ichneumon graminellæ*, Schrank, Fauna Boica, II, ii, p. 301, ♀ (?).
Cryptus examinator, F., *op. cit.* p. 85 (♀).
Pimpla examinator, Gravenhorst, *op. cit.* p. 207; *et auctt.*
Var. *P. bilineata*, Brullé, Hist. Nat. Ins. Hym. iv, p. 98 (♀); Lucas, Exp. Alg. iii, p. 323; Tosquinet, Ichn. Afr. p. 284 (♀).
? Var. *P. cheloniæ*, Giraud, Ann. Soc. Ent. France, 1869, p. 149 (♂ ♀).

♂ ♀. A somewhat smooth, black species, with the legs partly red and white and the coxæ black. *Head* immaculate, rounded behind the broadly and very slightly emarginate eyes; face convex and strongly punctate throughout; clypeus centrally depressed and apically margined; frons trans-aciculate; palpi piceous, with the three apical joints of the ♂ stramineous. *Antennæ* slender and nearly as long as the body; black throughout or apically ferruginous beneath; scape immaculate. *Thorax* of ♀, and sometimes of the ♂, with a more or less obsolete flavidous line before the radix; mesonotum evenly punctate and shining, with the notauli almost wanting; metathorax transversely aciculate-punctate, with no areæ; petiolar region glabrous and nitidulous, spiracles ovate and longer than broad; of ♂ with griseous pilosity. *Scutellum* immaculate, subconvex, finely punctate throughout with griseous pilosity. *Abdomen* closely and evenly punctate and somewhat dull; of ♂ subcylindrical, longer and a little narrower than the head and thorax; of the ♀ oblong-ovate, nearly double the length of and as broad as the thorax; first segment basally scrobiculate and bicarinate; segments with all the apical margins nitidulous though hardly elevated and not laterally tuberculate, often apically castaneous; terebra setigerous, about half the length of the abdomen. *Legs* red or fulvous, with the coxæ and trochanters red or (in var. *examinator*) black; anterior tibiæ more or less pale-banded before their base; hind legs somewhat elongate, dull

M 2

black, with the femora (except their extreme apices) red, and a conspicuous more or less white or rufescent band before the base of the tibiæ; hind claws nigrescent, much longer than the pulvilli and apically curved, of the ♀ not basally lobate. *Wings* somewhat infumate and ample; stigma and radius black or piceous, with the base and apex of the former pale; radix and often the tegulæ of the ♂ stramineous, of ♀ ferruginous and generally white anteriorly; areolet sessile or subsessile; nervellus emitted from the upper fourth of the strongly postfurcal first recurrent nervure of the lower wing.

Length 4–10 millim.

PUNJAB: Simla, ix. 1898 (*Col. Nurse*); ASSAM: Shillong, Khasi Hills, 6000 ft., iv. & v. 1903 (*Rowland Turner*); BURMA: Pashok, 4500 ft., iv. 1900 (*Col. C. T. Bingham*); TENASSERIM (*Doherty*, Ind. Mus.).

I have elsewhere (Ichneumonologia Britannica, iii, p. 101) expressed considerable doubt respecting the specific value of *P. examinator*; and I am now persuaded that it is synonymous with the present species. This is of some importance here, since the Indian form of this species, with the coxæ black, which has not hitherto been recorded outside the Palæarctic Region, is referable to the former name. I can trace no difference between the Oriental specimens and those found by myself abundantly in Europe, where it is to be met with in woods and shady places during the months of May and June, flying about bushes of oak, hazel and birch, except that the ♂ (*P. litigiosa*, Cam. MS.) has the whole of the anterior legs flavous; the characteristic curve above the nervellus is distinct. It has been bred in England, Germany and Austria from a very large variety of Lepidopterous hosts—between forty and fifty species; as well as, it is said, from the Coleopterous *Anthonomus pomorum* (*cf.* Elliott, Trans. Ent. Soc. 1907, p. 52) and the Hymenopterous *Tenthredo instabilis*. It is also rarely found upon umbelliferous flowers in September; and ranges throughout Europe, extending at least into Northern Africa. I have seen only two pairs from India.

109. Pimpla himalayensis, *Cam.*

Pimpla himalayensis, Cameron, Manch. Mem. 1899, p. 178 (♂).

♂. A black species, with the legs flavous and the hind tibiæ black at both extremities. *Head* glabrous and nitidulous; frons roundly and broadly prominent in the centre, coarsely and sparsely punctate above, where the pubescence is shorter than below; clypeus obsoletely punctate basally; mandibles nitidulous and black; palpi stramineous. *Thorax* with infuscate discal pilosity, longer and paler on the metathorax; latter strongly punctate, except centrally at the smooth base, becoming apically subreticulate; areola apically obsolete and twice as long as broad

with its sides straightly and stoutly carinate; propleuræ smooth and strongly nitidulous, deeply excavate below, with the apex punctate above and the sides crenulate throughout; mesopleuræ also shining and smooth, with the furrow near the base curved, moderately wide and deep, and not reaching the tubercles, subtriangularly punctate at the tegulæ, apically depressed below and bordered by a narrow crenulated furrow; metapleuræ strongly punctate above the lateral carinæ and basally rugose, more weakly below it. *Scutellum* and postscutellum glabrous and impunctate, with infuscate pilosity. *Abdomen* immaculate; petiole rugosely punctate throughout, basally impressed, laterally strongly carinate to beyond the centre and strongly, with the following segments closely, punctate, becoming gradually weaker towards the anus; venter black, with the basal segment plicate to shortly beyond its centre, apically smooth, laterally impressed and aciculate above, with the lower part finely strigose and its outer edge longitudinally striated. *Legs* with all the coxæ and femora fulvescent; anterior tibiæ and tarsi flavous; hind tibiæ black, with the centre broadly white and the tarsi nigrescent. *Wings* hyaline, with the stigma and nervures black; areolet laterally coalesced above, emitting the recurrent nervure at its apical third.

Length 12 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

110. **Pimpla apollyon**, sp. n.

♀. A large black species, with the anterior femora and tibiæ red. *Head* transverse, somewhat short and strongly narrowed behind the eyes; frons concave and subexcavate, not transversely aciculate and with no longitudinal sulcus; clypeus basally elevated, strongly depressed towards the glabrous and subtruncate apex; eyes oblong-ovate and slightly emarginate next the scrobes; face strongly and evenly punctate, with elongate griseous pilosity, centrally hardly but laterally distinctly convex, with the epistoma obsoletely glabrous; mandibles stout and basally coarsely punctate, margined below; palpi with the three apical joints fulvous. *Antennæ* (broken) slender and filiform, with the basal flagellar joints apically subnodulose and the first nearly half as long again as the second; flagellum not ferruginous beneath, scape finely punctate. *Thorax* stout, gibbous, immaculate; mesonotum and mesosternum evenly punctate and a little nitidulous, with obsolete notauli; mesopleuræ strongly punctate and posteriorly substrigose; metathorax subdeplanate and very strongly transaciculate throughout, with only the undefined petiolar area smoother; all the areæ wanting, lateral carinæ effaced by transstriation, spiracles elongate-oblong. *Scutellum* subelevated and black, not shining, with scanty pilosity. *Abdomen* black, oblong-ovate, longer and hardly narrower than the head and thorax;

first segment not carinate, basally excavate, with its centre strongly elevated and approximately bituberculate; the four basal segments scabriculously punctate, distinctly transversely impressed before their nitidulous apices and obliquely in their basal angles; the remainder smooth and not impressed; terebra hardly half the length of the abdomen, with the valvulæ shortly pilose. *Legs* somewhat stout and subelongate; red, with the coxæ and trochanters, the hind femora entirely and the apex and the base (narrowly) of their tibiæ, black; hind tarsi entirely nigrescent, with the claws stout, curved, distinctly a little longer than the pulvilli and neither pectinate nor basally lobate. *Wings* normal and distinctly fulvescent; stigma and radix fulvous, with the former almost paler basally; tegulæ red-spotted; areolet subsessile, somewhat transverse; the internal cubital nervure sinuate, with no nervelet; nervellus strongly postfurcal and intercepted far above the centre.

Length 17 millim.

MADRAS: Coonoor, Nilgiri Hills.

Type in the British Museum.

This female has the exact facies of *P. instigator*, but the frons is not transversely aciculate and has no central impressed line; the face, which is more elevated laterally than centrally, is not black-pilose; the metathorax is strongly strigose throughout, even to the lateral carinæ, which are obsolete; the scutellum is more convex and less shining; the basal segment is much more strongly elevated, with the tubercles much closer to each other, and the apices of the following segments are more distinctly transversely impressed; it is, however, most readily separated by the distinct coloration of the hind legs, of which the tibiæ are very much longer in proportion. I have seen but a single specimen.

111. **Pimpla latifoveata**, *Cam.*

Pimpla latifoveata, Cameron, Manch. Mem. 1899, p. 181 (♂).

♂. A black species, with the head anteriorly and the legs flavous, the scutellum brunneous and the abdomen red-marked. *Head* with the face and clypeus flavous, the former with large sparse punctation and short infuscate pilosity; frons and vertex glabrous and nitidulous, the former subconcave; mandibles (except basally) and the palpi flavous. *Antennæ* black, with the flagellum sub-brunneous apically beneath, with obsolete pubescence; scape flavous beneath, with a narrow black lateral line and sparse white pilosity. *Thorax* glabrous and nitidulous, black, with the metathorax, except at the smooth base and its apex, shallowly and isolatedly punctate; areola laterally and subdivergently carinate; pleuræ shining and impunctate below, metapleuræ sparsely punctate above the lateral costæ. *Scutellum* apically, and the postscutellum, brunneous. *Abdomen* black, with the venter

white; second and third segments narrowly red at the base, uniting obliquely down the sides with a broad red apical band; third or (?) fourth similarly coloured, with the apex darker, fourth rufescent at base alone; first segment with the petiole smooth basally and triangularly impressed, with the impression extending apically in the form of a deep and broad canaliculation, remainder deeply and distinctly punctate; apices of the three following segments glabrous. *Legs* stramineous throughout, with only the hind coxæ slightly, and their femora distinctly, fulvous. *Wings* hyaline, with the nervures nigrescent and the stigma

Fig. 36.—*Pimpla latifoveata*, Cam.

infuscate; areolet elongate, thrice as long as high, laterally coalesced above, with the recurrent nervure pellucid; tegulæ flavous.

Length 9 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

"This species, in the coloration of the legs, agrees with *P. himalayensis*, with which it also agrees in having two longitudinal keels on the base of the median segment; but it differs from it in the puncturation on the median segment being very much less strong and the punctures fewer in number; the puncturation on the abdomen is also weaker, and it differs in the form of the petiole, in which the apical furrow, so distinctly defined in the present species, is represented in *P. himalayensis* by a mere shallow depression; lastly, they are easily separated by the form of the areolet, and by *P. himalayensis* having the hinder tibiæ black and white, and the hinder tibiæ [*sic*] fuscous" (Cameron, *loc. cit.*). To me it appears much more closely allied in the red-marked abdomen and elongate basal fovea to my *Pimpla ampla*; but the entirely pale legs and venter and the broad areolet at once render this species distinct.

112. **Pimpla lætiventris**, *Cam.*

Pimpla lætiventris, Cameron, Manch. Mem. 1899, p. 183 (♀).

♀. A black species, with the legs red, their base and the abdomen laterally flavous. *Head* nitidulous, with the frons and vertex glabrous; ocelli laterally canaliculate; face densely pale-pilose; clypeus basally dull brunneous, deplanate throughout and covered with elongate infuscate pilosity; palpi stramineous, mandibles immaculate. *Antennæ* black. *Thorax* nitidulous, with short black pubescence; pronotum with a narrow flavous line on its apical half: pro- and meso-pleuræ glabrous and nitidulous, the latter centrally sparsely and the mesosternum densely pilose; metathorax strongly and uniformly punctate, with its apex and the areola glabrous and densely pilose; metapleuræ closely punctate above the curved lateral costæ and glabrous below them. *Scutellum* deplanate, aciculate, sparsely punctate, with a central basal foveola; postscutellum glabrous and nitidulous. *Abdomen* black, closely and strongly punctate throughout; third and fourth segments narrowly and obscurely, the fifth and sixth more broadly and clearly, laterally flavous; the sixth and seventh apically concolorous; terebra as long as thorax and abdomen. *Legs* red, with the coxæ and trochanters flavous, and the anterior femora also paler; hind tibiæ and tarsi subflavescent. *Wings* hyaline, with the costa, stigma and nervures testaceous; areolet broad and suboblique, laterally coalescent above and emitting the recurrent nervure from its apical fourth.

Fig. 37.—*Pimpla lætiventris*, Cam.

Length 10 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

This species is said by Cameron to be allied to his *P. latifoveata*, from which it differs in its more closely punctate metathorax, larger areolet, flavous pronotal fascia, and by the more strongly deplanate and punctate scutellum, though the structure of the last is not described under the latter species.

Genus **ITOPLECTIS**, *Först.*

Itoplectis, Förster, Verh. pr. Rheinl. 1868, p. 164.

Genotype, *Ichneumon maculator*, F.

This genus is so closely allied to *Pimpla* (*s. s.*) that it has for long had a precarious existence and no detailed description is requisite. Therefrom it may at once be known by the distinctly attenuate antennæ, elongate and recumbent thoracic pubescence, and usually tricoloured hind tibiæ. The clypeus is not apically emarginate; nervellus intercepting always above the centre; the metathoracic spiracles always small and usually circular; notauli obsolete; frontal orbits immaculate; tarsal claws basally not lobate; cheeks very short.

Range. Holarctic region.

Table of Species.

1 (4) Anterior coxæ and trochanters mainly or entirely black.	
2 (3) Frons closely punctate; hind tibiæ tricoloured	*alternans*, Grav., p. 169.
3 (2) Frons not punctate; hind tibiæ bicoloured	*orientalis*, sp. n., p. 171.
4 (1) Anterior coxæ and trochanters entirely stramineous	*sikkimensis*, Cam., p. 172.

113. **Itoplectis alternans**, *Grav.*

Pimpla alternans, Gravenhorst, Ichn. Eur. iii, p. 201; Ratzeburg, Ichn. Forst. ii, p. 92; Taschenberg, Zeits. Ges. Nat. 1863, p. 56; Schmiedeknecht, Zool. Jahr. 1888, p. 491 (♂ ♀); *cf.* Vollenhoven, Pinac. pl. ix, fig. 8 et Kriechbaumer, Ent. Nachr. 1887, p. 116.

P. tricincta, Thomson, Op. Ent. viii, p. 748 et xiii, p. 1408 (♂ ♀).

♂ ♀. A dull black species, with short, obsolete thoracic pilosity and usually tricoloured tibiæ. *Head* immaculate, short, transverse and a little narrowed behind the eyes; face distinctly pilose and closely punctate, especially in the centre; frons deplanate, closely punctate and not centrally canaliculate; vertex narrow and laterally pubescent; palpi white or stramineous. *Antennæ* not quite filiform, slightly incrassate towards the apices, nearly as long as the body, ferruginous or testaceous with the joints apically darker, beneath paler with the discally black scape flavous. *Thorax* gibbulous and black, with a pale callosity before the radix; mesonotum closely and confluently punctate, with short, somewhat sparse and subsetigerous pilosity, and very obsolete notauli; the pleuræ strongly nitidulous between the fine punctures; metathorax centrally glabrous throughout, with the areola basally subcostate and parallel-sided, apically widened and convergent with the petiolar area; spiracles small and circular (except in my var. *spiracularis*). *Scutellum* black, subdeplanate, obsoletely punctate

thoughout with griseous pilosity. *Abdomen* evenly and somewhat strongly punctate; of ♂ hardly deplanate, double the length of the head and thorax, hardly narrower than the latter and cylindrical, with the incisures subtestaceous; of ♀ deplanate, fully as long as head and thorax and subcylindrical; apices of the segments elevated, shining; basal segment laterally margined, with its base excavate and carinate to the centre; terebra half the length of the abdomen. *Legs* somewhat stout; the anterior pairs with the coxæ and trochanters black and usually flavous beneath, tibiæ and tarsi flavidous, with a paler band before the base of the former; posterior tarsi white, with the apices of the joints nigrescent; hind coxæ and trochanters black or badious, usually with the apices of the latter flavous, their femora always fulvous; tibiæ black, with a white band before the base and nearly always a red band before the apex; hind tarsi with the apical joint thrice as long as the penultimate and the claws simple, not basally lobate. *Wings* normal and usually slightly clouded; stigma

Fig. 38.—*Itoplectis alternans*, Grav.

piceous with the base paler, radix and tegulæ piceous or stramineous; areolet irregular, subsessile; nervellus intercepting far above the centre.

Length 5–10 millim.

Kashmir, 5000–6000 ft., v. 1901 (*Col. Nurse*). Punjab: Simla, ix. 1898 and vii. 1901 (*Nurse*, *E. P. Stebbing*).

This species has a known distribution throughout nearly the whole of Europe, but Dalla Torre gives no eastern localities for it; it is very abundant in Britain, where two distinct forms occur with equal frequency; the typical has the metathoracic spiracles circular and the other (var. *spiracularis*, Morl., Ichn. Brit. iii, p. 106) has them distinctly oval. It is to the latter form that the Indian insect is referable; and it also differs from the more common European one in having no rufescent coloration on the hind tibiæ, though I have seen similar specimens from Yorkshire.

Dr. Chapman has given some interesting notes on the economy

of this species (Trans. Ent. Soc. Lond. 1902, p. 728); and a full list of its hosts will be found in my Ichneumons of Britain (iii, p. 106), which goes to show that its parasitism is distributed among the Lepidoptera, Coleoptera, and phytophagous Hymenoptera, though in the case of Chapman's Spanish individuals it appears to have been hyperparasitic through an Ophionid Ichneumon upon one of the ZYGÆNIDÆ. A small female in the British Musuem was bred at Simla, on 7th July 1901, by Stebbing from *Eucosma stebbingi*, Wlsm.

114. **Itoplectis orientalis**, nom. nov.

Pimpla vidua, Cameron (*nec* Walsh), Manch. Mem. 1899, p. 180 (♂).

♂. A black species with dense white pubescence, the legs mainly red and the hind tibiæ white-banded. "Face and clypeus thickly covered with long, white hair; the front and vertex shining, impunctate, almost glabrous; the maxillary palpi are white; the labial fuscous. *Antennæ* black, the flagellum covered with a white down; the scape closely punctured, covered with longish, pale hairs. *Mesonotum* shining, obscurely punctured, as is also the scutellum; but the sides below the latter are strongly punctured; median segment [metathorax] coarsely, rugosely punctured, except the base and the apex in the middle; thickly covered with longish, fuscous hair; the lower part of the propleuræ behind strongly longitudinally striated; the mesopleuræ obscurely punctured, covered with longish, soft, white hair; the metapleuræ coarsely punctured, more closely and coarsely on the lower part. *Abdomen* entirely black; closely and coarsely punctured; the posterior segments with the puncturing weaker, and densely covered with long, white pubescence. All the coxæ are black, and thickly covered with white hair; the trochanters are black at the base; the hinder tibiæ and tarsi black, thickly covered with white hair; near the base of the tibiæ is a white band, which extends to shortly beyond the middle; the calcaria are white; all the femora, with the anterior tibiæ and tarsi, red. *Wings* hyaline, with the stigma and nervures black; areolet laterally subcoalescent above; the recurrent nervure is received near the apical third of the cellule.

"*Length* 8 mm."

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

The oft-repeated white pubescence reminds one of the genus *Stilbops*, but nothing is said of the metathoracic costæ, broad stigma or apically acuminate face, and one must consequently assume it to appertain to the subgenus *Itoplectis*, though the conformation of the spiracles and claws is not indicated.

115. Itoplectis sikkimensis, *Cam.*

Pimpla sikkimensis, Cameron, Zeits. Hym.-Dip. 1908, p. 41 (♀).

♀. Black, smooth and shining. *Head* with the palpi stramineous. *Thorax*: metanotum to the lateral carinæ densely white-pilose and strongly, though not very closely, punctate. *Scutellum* somewhat sparsely and feebly punctate. *Abdomen* closely and strongly punctate, more obsoletely towards its apex; terebra as long as the body, with its valvulæ densely clothed with black, sub-elongate pilosity. *Legs*: anterior pairs pale fulvous, with the coxæ and trochanters stramineous; intermediate tarsi infuscate; hind legs red, with their coxæ flavous above, their tibiæ whitish above and, like the whole of their tarsi, black beneath. *Wings* hyaline, with the stigma and nervures black; tegulæ stramineous; areolet broad above, emitting the recurrent nervure nearly at the base of its apical fourth; the transverse median received shortly behind the transverse basal.

Length 9 millim.

SIKKIM (*Bingham*).

Cameron says (*l. c.*) that this female "comes near *P. vidua*, Cam., which has, *inter alia*, the coxæ and the base of the trochanters black."

Genus EPIURUS, *Först.*

Epiurus, Förster, Verh. pr. Rheinl. 1868, p. 164.

GENOTYPE, *Pimpla brevicornis*, Grav.

Like the last, this genus is too closely allied to *Pimpla* (*s. s.*) to need any detailed description. It will at once be recognised by the distinctly emarginate apex of the clypeus; the invariably circular metathoracic spiracles; coarsely and distinctly punctate, and usually nitidulous, abdomen; elongately pilose terebra, which rarely exceeds the strongly tuberculate abdomen in length; the obsolete metanotal areæ; black cheeks; entire front femora of the ♂ and the elongate thorax.

The parasitic larvæ are gregarious and spin their dark brown, papyraceous cocoons upon one another within that of the host, which is usually, though not always, Lepidopterous and often a Bombycid. One species has been found by Dr. Giraud abundantly in galls upon *Triticum repens* and is supposed to be beneficial, by preying upon the small Dipteron, which makes the galls; but he hints that, for at least some part of its existence, the presumably parasitic larva subsists upon the purely vegetable tissues of the gall itself (*cf.* Morl., Ichn. Brit. iii, p. 88). Somewhat analogous observations have been made by Cameron in the case of *Epiurus gallicola*, Morl., which was found in the galls of the Tenthredinid, *Nematus viminalis*, Htg., and was observed to increase appreciably in size and bulk for a considerable period after finally consuming the host larva; presumably this could only be effected by means of the

gall-tissues, which in one case seemed to be preferred to those of the Sawfly, since both host and parasite were found living side by side in the same gall (*cf. lib. cit.* iii, p. 78). These two instances of possible phytophagous diet are very nearly unique among ICHNEUMONIDÆ, for Westwood has shown the observations in this direction by the older authors to have been fallacious (Introd. ii, p. 144).

Range. The Palæarctic region is very rich in species of this genus, which is hardly scarcer in Northern America; but we know only four at present from India, though it is quite possible that this paucity is to some extent accounted for by the inconspicuous coloration and comparatively small size of these insects.

Table of Species.

1 (6) Frons evenly punctate throughout.	
2 (5) Nervellus intercepted distinctly above the centre.	
3 (4) Facial punctures obsolete; radical callosities pale.	*satanas*, sp. n., p. 173.
4 (3) Facial punctures large; radical callosities immaculate	*nursei*, Cam., p. 174.
5 (2) Nervellus intercepted at its centre	*lineipes*, sp. n., p. 175.
6 (1) Frons strongly trans-strigose centrally (as in *Pimpla*)	*erebus*, Cam., p. 176.

116. **Epiurus satanas**, sp. n.

♂ ♀. A black species, with the legs, except the hind tibiæ and tarsi, red. *Head* narrower than the thorax, with the frons and vertex nitidulous and obsoletely punctate; ocellar region elevated and anteriorly circumsulcate; face nearly smooth, with elongate brown pilosity, and centrally elevated; clypeus strongly transverse, basally discrete throughout, with the apex depressed; cheeks wanting; palpi stramineous. *Antennæ* longer than half the body, subfiliform and slightly attenuate at both extremities; scape and base of flagellum testaceous in ♀, stramineous in ♂, beneath. *Thorax* subelongate and not broad, black, with a callus and a short line above it immediately before the tegulæ stramineous; notauli distinct but short; mesonotum nitidulous, with sparse recumbent pubescence; metanotum convex, evenly rounded, coarsely and irregularly punctate with elongate pilosity; areola laterally distinct and parallel-sided, extending to the centre, coalescent with the basal area and apically incomplete; lateral carinæ entire,

Fig. 39.—*Epiurus satanas*, Morl.

though weak; metapleuræ very much more strongly punctate than the mesopleuræ; spiracles small and subcircular. *Scutellum* hardly convex, finely punctate throughout and immaculate. *Abdomen* elongate-ovate and narrower in ♂, closely and distinctly punctate, with the apices of the first six segments roundly elevated, and the third to sixth laterally subtuberculate; basal segment subquadrate, punctate throughout, with somewhat strong carinæ a little converging at the apex; venter testaceous and strongly plicate on its basal half; terebra shorter than half the abdomen (3 millim.), with the pilose valvulæ black and the spicula stramineous, apically acuminate and red. *Legs* fulvous, with the anterior pairs paler; hind tibiæ stramineous, with their apices broadly, and a dot before the base above, black; hind tarsi except at extreme base, and apices of their femora obsoletely, nigrescent; all the claws small, curved and basally strongly lobate. *Wings* hyaline and not broad; costa and nervures piceous, stigma dark ferruginous, radix and tegulæ flavescent; areolet triangular, emitting the recurrent nervure from its apical third; nervellus straight, intercepting the slightly postfurcal recurrent nervure distinctly a little above its centre.

Length 10–12 millim.

ASSAM (*W. F. Badgley*).

Type in the British Museum.

This species is allied to *E. graminellæ*, Holmg., though the hind coxæ are but obsoletely punctate, and to *E. robustus*, Morl., from which the colour of the hind tibiæ will distinguish it; it appears very distinct from *E. erebus* in the conformation of the frons and coloration of the legs. I have drawn the above description from two pairs.

117. Epiurus nursei, *Cam.*

(?) *Pimpla punctata*, Thomson, Opusc. Ent. xix, p. 2126 (♀).
P. nursei, Cameron, Journ. Bombay Nat. Hist. Soc. xvii, 1906, p. 283 (♀).

♂ ♀. A black species with the legs, except anterior coxæ, red, and the terebra longer than the abdomen. *Head* posteriorly buccate and as broad as the eyes; occiput bordered, vertex glabrous with scattered punctures; frons evenly and not very closely punctate, with the scrobes densely transaciculate and of normal size; face nitidulous, with sparse large punctures and fine white pubescence; epistoma convex; clypeus truncately discrete basally, rugulose, with the apex emarginate and rufescent; mandibles subparallel-sided, centrally impressed, black, with the apical teeth small and of equal length; ligula and apex of palpi rufescent, cheeks not elongate nor eyes emarginate. *Antennæ* filiform, not very slender nor longer than half the body, black, with the apices rufescent and flagellar joints somewhat short. *Thorax* immaculate and shining, coarsely and somewhat deeply punctate discally, more

sparsely on pleuræ and sternum; mesonotum with short erect white pilosity and distinctly impressed notauli; metathorax short and abruptly declivous, with an apically obsolete triangular or subquadrate areola, trans-strigose and laterally entire petiolar area and quite circular spiracles, facing towards base. *Scutellum* strongly deplanate, shining black, with short erect pilosity and sparse but deep punctures. *Abdomen* immaculate and centrally somewhat dilated; all the segments strongly and confluently punctate, transversely subimpressed in the centre, with their apices glabrous and elevated; tubercles transverse and not strong; basal segment hardly longer than half its apical breadth, with the following distinctly transverse, especially towards the nitidulous anus; venter black, with the three basal segments centrally plicate; terebra as long as thorax and abdomen, with the valvulæ somewhat distinctly pilose and the apically incrassate spicula ferruginous; ♂ valvulæ strongly exserted. *Legs* bright fulvous throughout, with only the extreme base of the posterior tibiæ flavescent and the anterior coxæ black; ♂ with hind coxæ also mainly nigrescent; all the tarsal claws piceous and in ♀ strongly lobate basally. *Wings* normal and hyaline; radix, tegulæ, a small callosity before the latter, the base and apex of the stigma, and the front margin of the costa, clear stramineous; inner margin of costa and most of stigma ferruginous; areolet broadly triangular, emitting the recurrent nervure only slightly before apex; nervelet of internal cubital pellucid, brunneous and extending far beyond centre of the cell; nervellus intercepting the only slightly postfurcal first recurrent of lower wing at its upper third.

Length 12 millim.

BALUCHISTAN: Quetta, v. 04 (*Nurse*); KASHMIR, 5000–6000 ft., v. 01 (*Nurse*).

Type in Col. Nurse's collection.

Closely related to *Pimpla robusta*, Morl., but with the terebra much longer and body stouter; the peculiar coloration of the alar costa, short basal segment, and elongate nervelet render it very distinct. *P. punctata*, Thoms., indigenous to the northern islands of the Adriatic and Istria, appears to differ very little from *P. nursei*; but I do not know it.

I have been enabled, through the kindness of Col. Nurse, to draw the above description from the type specimen. I later found in his collection the hitherto unknown male, which he took in Kashmir.

118. **Epiurus lineipes**, sp. n.

♀. Entirely black, with the legs red and the hind tibiæ black-lined. *Head* obsoletely punctate and strongly nitidulous, broad but not buccate behind the entire eyes; face hardly pubescent, the epistoma longitudinally elevated; clypeus very short and deeply separated; palpi testaceous. *Antennæ* immaculate. *Thorax* strongly nitidulous throughout, extremely obsoletely punctate; mesonotum

with somewhat dense griseous pubescence and the notauli distinct in front; metanotum irregularly punctate, centrally smoother but with no areæ; spiracles circular. *Scutellum* immaculate and subdeplanate. *Abdomen* black, evenly and somewhat strongly punctate, with the apices of all the segments except the first nitidulous and trans-strigose, a little elevated and laterally prominent; basal segment not longer than apically broad, the second strongly impressed on either side of the centre at the base; third and fourth segments distinctly, second and fifth indistinctly, tuberculate in the centre on either side; venter testaceous, with only the basal segment plicate; terebra slightly shorter than abdomen. ferruginous, the valvulæ with long pubescence. *Legs* deep red and not elongate, with the hind tibiæ and tarsi alone blackish and the upper side of the former stramineous almost throughout; tarsal claws small and broadly lobate basally. *Wings* ample, slightly flavescent, with all the nervures except the costa pale; radix, tegulæ and stigma pale testaceous; areolet triangular, broader than high, and emitting the strongly curved second recurrent nervure from its apical fourth; hind wings with first recurrent exactly opposite and emitting nervellus from its centre.

Length 9 millim.

PUNJAB: Simla, x. 1906.

Type in the Pusa collection.

In the conformation of its terebra and wings, and in the colour of the stigma, body, and legs, this species closely approaches *Pimpla ventricosa*, Tschek, but the ocelli are not elevated upon a plateau, the metanotal carinæ are entirely wanting, and the abdomen is more uneven, with the segmental apices broadly glabrous and more prominent.

119. Epiurus erebus, *Cam.*

Pimpla erebus, Cameron, Manch. Mem. 1899, p. 184 (♀).

♀. A black species. *Head* with the face closely punctate and densely white-pilose; epistoma carinate and triangularly foveate basally; clypeus semicircularly impressed at the base, apically smooth, shining and obliquely impressed; frons strongly and transversely strigose centrally. *Antennæ* black. *Thorax* somewhat dull, with short and dense recumbent pubescence; mesonotum transversely strigose basally; mesopleuræ strongly punctate, with the apex glabrous above and striate below; propleuræ finely aciculate basally; metathorax finely trans-strigose at the base, centrally strongly striate, with the apex broadly glabrous. *Scutellum* elevated, glabrous and nitidulous, with sparse and elongate white pilosity; postscutellum with large and deep punctures. *Abdomen* immaculate; basal impression of first segment glabrous and nitidulous, its sides coarsely and not very distinctly punctate and the apex shallowly punctate; the second obscurely punctate and the remainder very finely and closely trans-reticulate; terebra

4 millim. *Legs* mainly black; coxæ obsoletely punctate and sparsely white-pilose. *Wings* hyaline, with their base subfulvescent; stigma and nervures black.

Length 13 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Fig. 40.—*Epiurus erebus*, Cam.

Cameron differentiates this species from all the other forms ascribed by him to the genus *Pimpla* in his 1899 paper, by its having the "body and legs entirely black;" but in his diagnosis we find "tibiis tarsisque anticis flavotestaceis," and later also "the middle knees are testaceous."

Genus EPHIALTES, *Schr.*

Ephialtes, Schrank, Fauna Boica, ii, 1802, p. 316.

GENOTYPE, *Ichneumon manifestator*, L.

A genus of strongly linear and parallel-sided insects, with the ovipositor never shorter than the length of the body. Head shortly transverse, a little buccate and hardly narrowed behind the oval and scarcely emarginate eyes; face deplanate, often pilose and not longer than broad; clypeus short and transverse, somewhat arcuately separated, with the apical margin centrally deflexed and excised, and the sides prominent; mandibles somewhat broad, only a little broader basally and often striate, with the apical teeth short and subequal in length. Antennæ filiform and somewhat slender; scape deeply excised externally; flagellum pilose, with the basal joints cylindrical. Thorax convex and subcylindrical; mesonotum nitidulous, with distinct notauli; lateral sulci deeply impressed and the sternauli wanting; metathorax scabrous or rugulose, with the pleuræ smoother, somewhat higher

than long, with the areola obsolete or narrow and sulciform; petiolar area smooth, very short and basally incomplete; spiracles oval or circular. Scutellum a little convex, subtriangular and not short. Abdomen sessile and cylindrical, scabrous, at least twice as long as thorax and generally bearing tubercles or rugosities; its segments generally elongate, and always apically elevated and nitidulous; basal segment parallel-sided, not shorter than broad, and centrally canaliculate, with the spiracles before the centre; apical ventral segment small and retracted from the anus, that of ♀ longitudinally excised; terebra at least as long as the body, with the valvulæ more or less strongly pubescent and not deflexed; ♂ valvulæ shortly exserted and often stout. Legs subelongate, very rarely dentate; apical tarsal joint twice or thrice as long as the penultimate; claws curved, not pectinate, those of ♀ lobately dilated at the base. Wings not broad; areolet irregularly triangular, sessile or petiolate, emitting the recurrent nervure from beyond its centre; radial cell narrow and elongate.

Range. India, Europe and North America.

Thomson very truly says (Opusc. Ent. viii. 737) that this genus stands so close to *Pimpla* that no exact line of demarcation can be found between them. In general, however, the species may be known by the parallel-sided and cylindrical abdomen, which is not coarsely punctate and always has the apices of the segments broadly nitidulous, elevated and trans-aciculate, the ♀ has the sixth to eighth segments transverse and the ♂ has the second strongly elongate; the flagellum is always entirely black, with the joints of uniform breadth throughout, though not distinctly discrete: the eyes are not unusually prominent, the vertex is broad, the clypeus apically emarginate or excised, and the terebra is not deflexed and is thicker than in *Pimpla*.

In Europe, the males of this genus are, like those of *Rhyssa*, much scarcer and always decidedly smaller than the females.

Table of Species.

1	(4)	Body flavous with black markings.	
2	(3)	Notauli very strongly impressed; metanotum punctate.	*nigritarsis*, Cam., p. 179.
3	(2)	Notauli not strongly impressed; metanotum glabrous.	*nigromaculatus*, Cam., [p. 179.
4	(1)	Body entirely black.	
5	(6)	Abdomen thrice the length of head and thorax; legs very short	*lachesis*, sp. n., p. 180.
6	(5)	Abdomen twice the length of head and thorax; legs of normal length.	
7	(10)	Radical callosities pale; hind femora red.	
8	(9)	Abdomen strongly tuberculate; terebra as long as body	*crassus*, sp. n., p. 181.
9	(8)	Abdomen hardly tuberculate; terebra longer than body	*iridipennis*, sp. n., p. 182.

10 (7) Mesothorax immaculate.
11 (12) Face strongly and uniformly punctate; hind femora black .... *tinctipennis*, Cam., p. 184.
12 (11) Face finely and, in centre, obsoletely punctate; hind femora red.
13 (14) Scape, not pronotum, pale; terebra shorter than body .... *longiventris*, Cam., p. 185.
14 (13) Pronotum, not scape, pale; terebra longer than body .... *latiannulatus*, Cam., [p. 185.

120. Ephialtes nigritarsis, *Cam.*

Ephialtes nigritarsis, Cameron, Manch. Mem. 1899, p. 148 (♂).

♂. A flavous species with black markings, the mesonotal notauli very deeply impressed and the metanotum punctate. *Head* smooth, with the face nitidulous and feebly punctate; frons broadly, the vertex above, occiput and mandibles, black; the last basally, and the palpi, flavous; epistoma subprominent and laterally black. *Antennæ* black and nearly as long as the body, with the scape flavescent beneath and the flagellum basally piceous. *Thorax* nitidulous; central lobe of mesonotum pyriform, elevated and distinctly separated from the lateral lobes, all three centrally black; propleuræ glabrous, with their apices and base of mesopleuræ obsoletely punctate, the latter and the sternum broadly black; metanotum strongly punctate, with its apex subglabrous and its base elongately impressed; metapleuræ somewhat strongly punctate, more finely basally above, with the basal impression black. *Scutellum* and postscutellum glabrous. *Abdomen* smooth, with the second and third segments distinctly impressed transversely, strongly punctate centrally and laterally rugose; the first broadly impressed centrally, and the two following transversely impressed beyond the centre and obliquely on either side; all the segments centrally black, with the third broadly black only at the base, and the colour most extensive on the fifth and sixth segments. *Legs* flavous, with dense and elongate white pilosity; hind tarsi, the apices of their tibiæ and of their coxæ, black; calcaria stramineous. *Wings* hyaline and basally subfulvescent; costa and stigma infuscate, and internally paler; areolet transverse, receiving the recurrent nervure at its apical fourth, and having its external nervure curved.

Length 16 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

121. Ephialtes nigromaculatus, *Cam.*

Ephialtes nigromaculatus, Cameron, Manch. Mem. 1899, p. 150 (♀).

♀. A flavous species with black markings, and the metanotum entirely glabrous. *Head* flavous, with the vertex broadly in the

centre, and occiput more broadly above, black; face obsoletely punctate, with elongate pale pilosity and a small black central spot; clypeus subglabrous and basally sulcate transversely; mandibles apically broadly black; palpi stramineous. *Antennæ* nigrescent; scape closely punctate and black, with elongate pale pilosity and its apex flavous; flagellum basally piceous, with dense and obsolete pubescence. *Thorax* flavous; mesonotum glabrous and nitidulous, with a large black mark on each of the deplanate and but indistinctly discrete lobes; pro- and meso-pleuræ black-marked; metathorax entirely glabrous and impunctate, with its apex black-marked and no distinct basal impression; metapleuræ entirely glabrous below, closely and strongly punctate above. *Scutellum* apically, and the postscutellum, black. *Abdomen* strongly punctate, with the anus smoother and the basal fovea glabrous; first segment black-lined throughout; second to seventh centrally

Fig. 41.—*Ephialtes nigromaculatus*, Cam.

black-lined, with the second to fifth bearing also smaller lateral black marks; terebra as long as the body, with the valvulæ black and densely infuscate-pilose. *Legs* nitidulous, stout and densely white-pilose, with the apices of the posterior trochanters and the base of the hind tibiæ black; hind tarsi nigrescent. *Wings* clear hyaline with the nervures and stigma deep black; areolet oblique, and triangular above, emitting the recurrent nervure from its apical third.

Length 13–14 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

122. **Ephialtes lachesis**, sp. n.

♂ ♀. A dull and linear species, with the abdomen three times as long as the head and thorax; black, with the ligula, palpi,

underside of scape, the tegulæ and the very short legs, flavescent. *Head* hardly transverse and somewhat broadly rounded behind the internally slightly emarginate eyes; occiput broadly emarginate and not bordered; vertex strongly nitidulous, somewhat broad, obsoletely and very sparsely punctate; scrobes distinct; face evenly protuberant throughout, shining and distinctly punctate, with sparse grey pilosity; mandibles and the concave clypeus piceous. *Antennæ* filiform and somewhat shorter than half the body; of ♂ rufo-ferruginous throughout, of ♀ black or nigrescent, with the three or four apical joints entirely rufescent and, in both sexes, the scape flavous beneath. *Thorax* immaculate, discally deplanate and cylindrical, with the mesonotum obsoletely punctate and nitidulous, and the metanotum strongly punctate and closely white-pilose; areæ of metathorax entirely wanting, its apex glabrous, with deeply impressed lateral foveæ; lateral carinæ distinct and the spiracles subcircular. *Scutellum* deplanate, immaculate and somewhat strongly but not closely punctate. *Abdomen* strongly elongate, linear, exactly thrice the length of the head and thorax, all the segments dull and closely punctate and pilose, with their apices laterally constricted and apically nitidulous; basal segment double the length of its apical breadth, gradually a little dilated throughout and, in ♀, a little longer than the short and subquadrate sixth; venter ochraceous and indefinitely plicate; terebra very slightly longer (18 millim.) than the abdomen (16 millim.), with the valvulæ slender, black and pilose. *Legs* peculiarly short and somewhat stout; the anterior testaceous, with the coxæ and trochanters paler; the hind ones fulvous, with apices of tibiæ and the claws infuscate; the latter basally lobate in the ♀. *Wings* narrow and hyaline, with the stigma blackish; areolet sessile and broadly triangular; basal nervure continuous through the median; nervellus distinctly a little postfurcal and intercepted above its centre.

Length, ♂ 17, ♀ 20 millim.

BURMA: Bhamo, vii. 86, and Karen Hills, 3000–3700 ft. (*L. Fea*).

Types in the Genoa Museum.

The strongly elongate abdomen and short legs are distinctive of this species.

The foregoing description is drawn from a single pair.

123. **Ephialtes crassus**, sp. n.

♀. A black species, with pale stigma and very distinct tubercles. *Head* black, with the palpi testaceous and the clypeus immaculate; vertex broad and strongly nitidulous, with a few fine and scattered punctures; occiput broad, bordered and hardly emarginate; face nitidulous and convex, with strong and close punctures; clypeus semicircularly impressed centrally, and not produced on either side; mandibles stout. *Antennæ* filiform and obsoletely pilose

throughout. *Thorax* with a linear flavescent mark before the radices; notauli not reaching the centre of the nitidulous mesonotum; mesopleuræ somewhat closely and finely punctate, with the lateral sulci large and their region entirely glabrous, sternauli wanting; metathorax scabrous, with the pleuræ finely punctate and smoother, its disc indistinctly bicarinate basally; spiracles subcircular. *Scutellum* black, subconvex, shining and not closely punctate. *Abdomen* immaculate, cylindrical, fully as broad as the thorax, and twice the length of the head and thorax; basal segment not strongly elevated, longitudinally bicarinate to its centre only; second obliquely impressed to its centre; the intermediate segments not longer than broad, laterally strongly tuberculate, with their apices hardly smoother; terebra hardly longer than the body, with the valvulæ pilose and somewhat stout. *Legs* normal and red, with the posterior tibiæ and tarsi blackish; apical joint of the hind tarsi thrice as long as the penultimate, and all the slender claws basally lobate. *Wings* siliceous; stigma ferruginous, radix and tegulæ ochraceous; areolet sessile and sub-irregularly triangular; lower wings with the basal abscissa of the radius nearly half as long again as the second recurrent nervure; nervellus slightly postfurcal and intercepted distinctly above the centre.

Length 12 millim.

PUNJAB: Simla, iv. 97 (*Col. Nurse*).

Type in Col. Nurse's collection.

I have seen a single ♀ of this species in Col. Nurse's collection, which had been identified by Cameron as a small form of *E. iridipennis*, from which, however, it very materially differs in the very much stouter and more strongly tuberculate abdomen; and, in fact, it is very nearly allied indeed to Thomson's *E. heteropus*, but the abdomen is more closely punctate, with more acute tubercles, the basal segment is much stouter and subparallel-sided, the hind legs are apically black and the radial abscissa of the hind wings is distinctly a little shorter.

124. Ephialtes iridipennis, sp. n.

Ephialtes iridipennis, Cam. MS. (♀).

♂ ♀. A large linear black species, with dark stigma and obsolete tubercles. *Head* immaculate, posteriorly buccate, but hardly broader than the eyes; vertex nitidulous and obsoletely punctate, somewhat broad behind the ocelli and with the occiput centrally emarginate; face nitidulous and slightly elevated longitudinally in the centre, with small sparse punctures and griseous pilosity; clypeus rufescent, not broad, centrally depressed and punctate, not laterally produced, but triangularly impressed before the apex; mandibles broad, obsoletely punctate, basally rufescent and centrally canaliculate towards the apex; palpi testaceous. *Antennæ* obsoletely pilose and entirely black; scape excised nearly to its

base; flagellum filiform throughout, extending to centre of abdomen. *Thorax* with a small pale callosity before radix and a red spot at base of mesopleuræ; mesonotum strongly nitidulous, with short black pilosity, longitudinally coalesced punctures, and the notauli reaching the centre; mesopleuræ and their sternum nitidulous and finely though distinctly punctate, sternauli wanting; metathorax with no areæ, finely punctate and shining, with the pleuræ rougher and somewhat dull, the disc feebly bicarinate at extreme base only; lateral costæ entire, spiracles small and oval, apophyses wanting. *Scutellum* black, nitidulous, subdeplanate, with sparse punctation and black pilosity. *Abdomen* immaculate, parallel-sided, fully twice as long as, though not broader than,

Fig. 42.—*Ephialtes iridipennis*, Morl.

the thorax, scabrous, with the segmental apices nitidulous; first segment fully twice as long as broad and hardly constricted basally; thyridii of the second deeply impressed and extending to centre; segments two to five longer than broad and laterally subincrassate in the centre, though hardly tuberculate; terebra nearly half as long again as the body (30 millim.), distinctly and shortly pectinate throughout and apically deflexed. *Legs* elongate, clear red, with the hind tibiæ and tarsi blackish, their claws curved and strongly lobate basally. *Wings* subhyaline and somewhat narrow; areolet triangular and subsessile, nervelet wanting; stigma blackish, radix and tegulæ flavescent; lower wing with basal abscissa of radius half as long again as the second recurrent nervure; nervellus slightly postfurcal and intercepted a little above the centre.

Length, ♂ 12, ♀ 23 millim.

PUNJAB: Simla, vii. 97 (*Col. Nurse*); TENASSERIM (*Doherty*—Ind. Mus.).

Type in Col. Nurse's collection.

This handsome species is extremely closely allied to *E. manifestator*, L., but the punctation of the head is finer, the clypeus red and not apically produced, the metanotum is more nitidulous and punctate, with but obsolete carinæ, the terebra is longer, and the nervellus intercepts at a distinctly lower point.

A male, found by W. Doherty in Tenasserim and now in the Calcutta Museum, so exactly coincides with the type in every way that, in spite of the very different locality, I have no hesitation in associating them; the size of the sexes is, as I have already mentioned, usually disproportionate in this genus, as is proved by four males bred by Stebbing from some species of *Chrysobothrus* in deodar at Simla.

125. **Ephialtes tinctipennis**, *Cam.*

Ephialtes tinctipennis, Cameron,* Manch. Mem. 1899, p. 151 (♂).

♂. An entirely black species, with only the anterior legs flavous. *Head* deep black, with the frons and vertex smooth, shining and sparsely infuscate-pilose; orbits impressed and acutely margined; face strongly and uniformly punctate and, like the clypeus, densely and elongately infuscate-pilose; the latter smooth, centrally semicircularly impressed and apically testaceous; mandibles black, palpi testaceous. *Antennæ* deep black; scape somewhat strongly punctate, with elongate pale and dense pilosity; flagellum entirely glabrous. *Thorax* glabrous and nitidulous, with the pro- and meso-pleuræ basally crenulate, and the mesosternum finely punctate and basally carinate; metanotum strongly and uniformly punctate, becoming laterally substrigose; petiolar area wanting, semicircular and glabrous; metapleuræ obsoletely punctate, with a carina above and below. *Scutellum* and postscutellum immaculate; the former sparsely and shallowly punctate, with elongate pilosity; the latter minutely punctate and nitidulous. *Abdomen* entirely black, closely and strongly punctate; first segment with its basal fovea glabrous and its apex more strongly punctate than the second segment. *Legs* fulvous; the hind ones black, with the exception of the rufescent apices of the trochanters and the extreme base of the femora; hind calcaria pale testaceous. *Wings* hyaline and slightly fulvescent; stigma

Fig. 43.—*Ephialtes tinctipennis*, Cam.

infuscate; areolet triangular and laterally coalescent above, emitting the recurrent nervure from its basal fourth.

Length 19 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the British Museum; the apical half of the abdomen is wanting.

126. **Ephialtes longiventris**, *Cam.*

Ephialtes longiventris, Cameron, Zeits. Hym.-Dipt. 1908, p. 37 (♀).

♀. A black species, densely clothed with white pubescence, which is longest on the sides of the thorax and abdomen. *Head* immaculate; face finely punctate and centrally subglabrous, as are also the frons and vertex. *Antennæ* black, with the scape, except above, bright citrinous. *Thorax* immaculate; the pro- and meso-pleuræ glabrous and nitidulous, mesonotum closely but not strongly punctate; metanotum much more strongly and apically closely punctate, extending to the lateral carinæ; metapleuræ glabrous and nitidulous. *Abdomen* elongate and slender, with the two basal segments longer than the head and thorax; first segment only slightly longer than half the second; terebra only slightly shorter than the body. *Legs* with the anterior pairs bright flavous; hind ones with their coxæ and femora bright red, their trochanters basally black and apically white, their tibiæ and tarsi dull pale flavescent, with the former below and at their apices entirely black; apices of all the tarsal joints subinfuscate. *Wings* hyaline, with the nervures and stigma black.

Length 27 millim.

SIKKIM (*Col. C. T. Bingham*).

Type. Location unknown.

I have not seen this species, of which Cameron (*l. c.*) says: "The abdomen is longer and thinner than usual; as compared with *E. iridipennis*, Cam., from Simla, apart from the marked difference in the colouration of the legs, that species may be known by the first abdominal segment being longer than the second. In *E. latiannulata*, Cam., from Sikkim, the first abdominal segment is as long as the second, the abdomen is stout, not elongated, and the legs are rufous, the four hinder tarsi black, the hind tibiæ black, broadly white above." It may be the ♀ of *E. tinctipennis*, though femoral coloration is usually constant in this genus.

127. **Ephialtes latiannulatus**, *Cam.*

Ephialtes latiannulatus, Cameron, Tijds. Ent. 1907, p. 96 (♀).

♀. A black species, with only the pronotum pale, and the terebra longer than the body. *Head* with the frons and vertex smooth and shining, but laterally closely punctate; face, except laterally, with dense elongate and infuscate pubescence; palpi pale flavous.

Thorax with the pro- and meso-thorax smooth, with short and sparse pilosity; apex of pronotum with a citrinous line; metathorax closely and strongly punctate, and densely pilose; metanotum centrally glabrous. *Scutellum* black. *Abdomen* immaculate, closely and strongly punctate, with dense infuscate pubescence; terebra longer than body (19 millim.). *Legs* red, with the anterior coxæ and trochanters pale flavous; hind tibiæ pale flavous, with the underside, the apex and a band before the base black, as also are the posterior tarsi. *Wings* hyaline, with the stigma and nervures black; tegulæ citrinous; areolet sessile, emitting the recurrent nervure from the base of its apical third part; nervelet distinct but minute.

Length 17 millim.

SIKKIM (*Col. C. T. Bingham*).

Type. Location unknown.

I am not acquainted with this species.

Genus HEMIPIMPLA, *Sauss.*

Hemipimpla, Saussure, Grandidier's Hist. Madag., Hym. 1892, pl. xiii, fig. 8.
Erythropimpla, Ashmead, Proc. U.S. Nat. Mus. 1900, p. 57.
Trichiothecus, Cameron, Jour. Str. Br. R. As. Soc. 1903, p. 136.

GENOTYPE, *H. caffra*, Sauss.

Head very strongly transverse and obliquely truncate immediately behind the unusually prominent eyes, which are internally but slightly emarginate next the scrobes; occiput basally bordered; ocelli elevated upon a common plateau above the level of the concave vertex; face deplanate and subglabrous, with the clypeus apically emarginate and basally but indistinctly discrete; mandibles stout, with the upper tooth the longer; cheeks somewhat shorter than the basal width of the mandibles. Antennæ setaceous, apically attenuate and distinctly short. Thorax glabrous: notauli distinct in front; metathorax glabrous, with no trace of areæ, its spiracles oval and facing towards the apex. Scutellum glabrous and not convex. Abdomen very strongly punctate, with the apical angles of the segments acutely prominent; transversely incised at their apical third, the incision becoming laterally confluent with another, rising obliquely from the depressed base of each segment; terebra stout and not shorter than abdomen, with pilose valvulæ. Legs short and not slender; tarsal claws curved, somewhat small and, in ♀, elongately lobate basally; front calcaria curved. Wings somewhat narrow and always more or less deeply infumate; radius usually sinuate above the oblique areolet, which emits the recurrent nervure from its apical fourth; first recurrent of lower wing subopposite and emitting the nervellus from distinctly below its centre. Size large; thorax red; hind legs concolorous with abdomen.

Range. South Africa, India, Malay Archipelago.

This genus is certainly allied to *Epiurus* in its emarginate clypeus, lobate ♀ claws, strongly uneven abdomen, subcircular metathoracic spiracles and short antennæ. Its species are very beautiful (*cf.* Distant, Nat. in Transvaal, 1892, p. 227).

Ashmead characterised his genus (*loc. cit.*) as having:—The areolet oblique and rhomboidal; the first recurrent nervure of the lower wings intercepted very far above its centre; the tarsal claws lobate strongly at their base, and not pectinate; the metathorax smooth, with no trace of either carinæ or areæ; the second to fifth segments with deeply impressed and laterally continuous sulci at both base and apex; and finally, having the clypeus semicircularly emarginate at its apex and not discrete from the face at its base. But elsewhere (*lib. cit.* p. 55) he distinctly says that the clypeus *is* discrete from the face, and it is entirely upon the separation of the clypeus that *Hemipimpla* differs from *Erythropimpla*, since in all other particulars, such as the glabrous metanotum, elongate spiracles, terebra longer than abdomen and basally lobate claws, it very perfectly agrees therewith. It is obvious, I think, that Ashmead did not really know *Hemipimpla*, and equally obvious that his table is herein defective. Cameron has further complicated the matter by redescribing the genus under the name *Trichiothecus*.

The superficial resemblance of some of the following species to the Braconid genus *Myosoma*, found in the Malay Archipelago and probably in India, is very remarkable.*

Table of Species.

1 (4) Abdomen testaceous, closely and confluently punctate, at least discally.	
2 (3) Basal segment distinctly punctate and ex-carinate; alar infumescence broader and darker	*testacea*, Cam., p. 188.
3 (2) Basal segment impunctate and strongly bicarinate; alar infumescence narrower and paler	*caffra*, Sauss., p. 189.
4 (1) Abdomen black, very deeply and somewhat sparsely punctate throughout.	
5 (6) Stigma black and the whole wings nigrescent	*rugosa*, de G., p. 190.
6 (5) Stigma and wings, except apices of latter, testaceous	*ariana*, Cam., p. 192.

* It has been suggested (Journ. Str. Br. Royal Asiatic Soc. 1903, p. 137) that *Pimpla viridipennis*, Smith (Proc. Linn. Soc., Zool. 1860, suppl. p. 64) ♂, described from Celebes, probably belongs to the present genus; no doubt can remain that this is the case, and but little can be entertained that it is the alternate sex of Cameron's *Trichiothecus ruficeps*. I have not entered it in the synonymy, however, since I have had the opportunity of examining only the single example, labelled "*Pimpla viridipennis*, var. *a*; Mak[assar]." in the National Collection, and not the type, which is to be sought in the Wilson Saunders Collection at Oxford.

128. **Hemipimpla testacea**, *Cam.*

Erythropimpla testacea, Cameron, Tijds. Ent. 1907, p. 98 (♀).

♂ ♀. An entirely testaceous species, with the antennæ, terebra and apices of the wings alone infuscate; postpetiole dull and deeply punctate. *Head* flavidous, transverse and very strongly constricted behind the prominent and brownish eyes; occiput glabrous and nitidulous, finely bordered posteriorly, with a few scattered punctures; ocelli infuscate and elevated upon a common plateau; frons glabrous, with the scrobes large and extending nearly to the ocelli; face deplanate, with a few scattered punctures and hairs, centrally subelevated longitudinally and distinctly discrete from the deplanate and apically emarginate clypeus; mandibles not very stout, with the infuscate teeth, of which the upper is the longer, apically obtuse; cheeks somewhat shorter than the basal breadth of the mandibles; eyes only slightly emarginate next the scrobes. *Antennæ* black, somewhat shorter than the body and apically attenuate; of ♀ with scape beneath, of ♂ with the whole scape and underside of the flagellum, testaceous; joints cylindrical and not elongate. *Thorax* glabrous, strongly nitidulous, with sparse flavous pubescence on the metathorax; notauli anteriorly distinct; metathoracic areæ entirely wanting, but with distinct sparse and fine punctation; spiracles small, oval and facing towards apex. *Scutellum* glabrous and not convex, with a few erect flavidous hairs. *Abdomen* fusiform-cylindrical and broadest centrally, entirely testaceous or rufescent, strongly punctate throughout, with the apical angles of the segments prominent; basal subquadrate or in ♂ a little longer than apically broad, laterally canaliculate on either side and in ♂ strongly carinate; the four or five following segments deeply incised transversely at their apical third, the incision becoming laterally confluent with another which rises obliquely from the depressed base; venter of ♂ alone basally plicate, its valvulæ small, pilose, blackish and hardly exserted; terebra black, slightly longer than the abdomen, with the valvulæ slender and pilose. *Legs* short and stout, testaceous, with the stout, basally strongly lobate claws, which in ♀ hardly extend beyond the pulvilli, alone blackish; front femora and tibiæ simple, their calcaria curved. *Wings* not broad, strongly flavescent, with the external margin broadly, or in ♀ the apical third, infumate; radix, tegulæ and stigma testaceous, the costa concolorous, becoming blackish at its apex; radius in ♂ curved above the somewhat oblique areolet, which emits the recurrent nervure from near its apex; lower wings with first recurrent subopposite and emitting the nervellus distinctly below its centre; costa in ♂ narrowly black at emission of radial nervure.

Length 12–17 millim.

Sikkim, iv–vi. 1900 (*Bingham*—Brit. Mus.); Assam: Margherita (Ind. Mus.); Burma: Mandalay, ix. 98 (*Bingham*—Brit. Mus.).

Type. Location unknown.

This, with the exception of the next one, is the only species of its group with entirely pale body and thoracic pilosity; the abdomen is duller and more closely punctate, with its incisions less deeply impressed and the infumescence of the wings more sharply defined than in *C. rugosa* and *C. ariana*, of which it would at first sight appear to be little more than a xanthic variety. The ♂ differs somewhat materially in having the radial nervure distinctly more curved above the less petiolate areolet; this sex has not before been described.

I was not acquainted with Cameron's description when drawing up my account of this insect, but there can be no doubt that he refers to the present species, upon which he remarks that the temples are distinctly developed, roundly narrowed; the central part of the basal segment is broad, transverse and not roundly narrowed as in his other species of this genus.

129. **Hemipimpla caffra**, *Sauss.*

Hemipimpla caffra, Saussure, Distant, Nat. Transv. 1892, p. 227 (♀).
Pimpla olynthia, Cameron, Manch. Mem. 1899, p. 156 (♀).
Erythropimpla olynthia, Cameron, Tijds. Ent. 1907, p. 99.

♂ ♀. "Uniformly rufo-ferruginous. The face, palpi, orbits and apices of the four anterior coxæ, pale yellow. The orbits and base of the mandibles and palpi yellow; the apex of the mandibles black. Scape of antennæ rufo-ferruginous; the base of the flagellum dark rufous on the underside. The thorax is more elongated and narrowed behind the tegulæ than usual. Petiole smooth, impunctate, the base oblique, the sides distinctly margined; the keel being continued to the centre of the apical portion, on the outer side of the middle; the space between being depressed; the second, third, and fourth segments are closely punctured down the middle, and on the transverse depressions; the fifth is broadly depressed at the base and more strongly and closely punctured; the sixth is closely and finely punctured; the apical almost impunctate; the ventral segments, except the apical one, sulphur-yellow; terebra 16 mm.; sheaths of the ovipositor covered thickly with pale, somewhat rufous, hair. The coxæ and femora are covered with moderately long, white, the tibiæ and tarsi very thickly with shorter, more fulvous coloured, hairs; the claws are black. Wings yellowish hyaline; the apices of both with oblique smoky clouds, the costa, stigma and nervures yellowish; the areolet oblique; the recurrent nervure is received in the apical fourth of the cellule.

"*Length* 18 mm."

Sikkim, iv–vi. 1900 (*Bingham*); Assam: Khasi Hills (*Rothney*); Burma: Moulmein (*Archdeacon Clerk*). Transvaal: Pretoria (*W. L. Distant*, type).

Type in the British Museum; that of *P. olynthia* in the Oxford Museum.

Cameron, whose description is quoted above, says (*loc. cit.* 1899) that this species agrees with Smith's New Guinea *Pimpla nigricornis*, ♂ (Journ. Linn. Soc. viii, 1864, p. 64), but that the latter is smaller and has the mesonotum punctate. From all its allies here described, this female is at once known by the impunctate and strongly bicarinate basal segment, and centrally more closely punctate abdomen (the pilosity of the legs also appears distinctive), though it is obviously very strongly allied to *H. testacea*, which, however, has the abdomen distinctly punctate throughout and the hypopygium concolorous with the remainder of the venter. Saussure's *Hemipimpla caffra*, from Pretoria, is certainly synonymous with the Indian species.

A single ♀ from Moulmein in the British Museum, taken in 1843, differs in having the infumate alar margin subobsolete.

130. **Hemipimpla rugosa**, *de G.*

Sphex rugosus, de Geer, Mém. Hist. Nat. Ins. iii, 1773, p. 597, pl. xxx, figs. 18, 19; Göze, Abh. Gesch. Ins. iii, 1780, p. 387, pl. xxx, figs. 18, 19 (♀).
Ichneumon rugosus, Retzius, Gen. et Spp. Ins. 1783, p. 67; *cf.* Gravenhorst, Ichn. Eur. iii, p. 1019 (♀).
Ichneumon vacillator, Olivier, Encycl. méth. 1792, p. 180 (♀).
Pimpla bipartita, Brullé, Hist. Nat. Ins. Hym. iv, 1846, p. 88 (♀); Tosquinet, Ichn. d'Afrique, 1896, p. 297 (♂ ♀).
Rhyssa bipartita, Vollenhoven, Stett. Ent. Zeit. 1879, p. 142 (♀).
Trichiothecus ruficeps, Cameron,* Jour. Str. Br. Roy. As. Soc. 1903, p. 137 (♀).

♂ ♀. A handsome black species, with the head and most of the thorax red, and the wings deeply clouded throughout. *Head* entirely red, transverse and strongly constricted behind the prominent and black eyes; occiput abruptly declivous, glabrous and nitidulous, finely bordered posteriorly, with a few obsolete punctures; ocelli infuscate and elevated upon a common plateau; frons glabrous, with the scrobes large and extending nearly to the ocelli; face deplanate, with a few fine scattered punctures and black hairs, centrally subelevated longitudinally and discrete from the deplanate and centrally impressed clypeus; mandibles not very stout, with the subequal teeth infuscate and apically subobtuse; cheeks somewhat shorter than the basal breadth of the mandibles; eyes only slightly emarginate next the scrobes. *Antennæ* black, forty-jointed, somewhat shorter than the body and apically attenuate; scape rufescent throughout; flagellar joints cylindrical and not elongate, with the basal ones apically subnodulose. *Thorax* red, glabrous and very strongly nitidulous, with sparse griseous pilosity on the infuscate metathorax; notauli anteriorly distinct; metathoracic areæ entirely wanting, but with

distinct sparse and fine punctation; spiracles small, oval and directed towards the apex. *Scutellum* glabrous and not very convex, with a few erect dark hairs. *Abdomen* fusiform-cylindrical and broadest centrally, entirely dull black or sometimes with a cyaneous reflection, strongly punctate throughout, with the apical angles of the segments prominent; basal segment not longer than apically broad, a little narrowed basally, centrally elevated and laterally scabriculous; the five following segments deeply incised transversely at their apical third, the incision becoming laterally confluent with another which rises obliquely from the depressed base; anus smoother and shining; venter with the four basal segments plicate; terebra black, of the same length as the abdomen, with the valvulæ slender, pilose, and the spicula castaneous. *Legs* short and somewhat stout, red, with the hind pair entirely and more or less of the intermediate coxæ black; claws small and strongly lobate; front femora and tibiæ simple, their calcaria curved. *Wings* not broad, strongly infumate throughout; radix and tegulæ red; stigma black and costa concolorous, becoming rufescent at its base; areolet somewhat oblique and emitting the recurrent nervure from near its apex; lower wing with the first recurrent subopposite and emitting the nervellus distinctly below its centre.

Fig. 44.—*Hemipimpla rugosa*, de G.

Length 17–18 millim.

The ♂ is described as differing but slightly from the ♀ in having the vertex somewhat brunneous, the antennæ of forty-two joints, the abdomen with no bluish reflection and the front legs subflavescent.

Length 16 millim.

"East Indies" (*teste* Brullé). Borneo.

At first I had supposed the only ♀ I had seen of this species to be no more than a melanic variety of the following, but in a long series of the latter the nervellus is quite uniform in its direction, and in the present species it is exactly as in *H. testacea*, from which the black body and hind legs, more shining and deeply incised abdomen, together with the entirely violaceo-infumate wings, will instantly distinguish it. Tosquinet compares it with *Pimpla cognata*, Tosq., and says its size is larger, the conformation stouter, the colour different, the terebra double as long and the

nervellus not postfurcal; he adds that the extent of the rufescent coloration is slightly variable, but the description I had drawn up of the Bornean ♀ agrees entirely with that of his African specimens (Togoland and Senegambia). Van Vollenhoven did not know the present species and merely conjectured it to be a *Rhyssa*, allied to his *R. laniaria*, on account of its similar coloration and terebral length.

Brullé vaguely records the female from "les Indes orientales"; and I have described above another, which is in the British Museum, bearing a pencil label: "Indrulaman, October, 1895; H. H. Everett." I have seen the type of *T. ruficeps*, Cam., from Kuching, Borneo, in the British Museum, where also is another female, taken at Mount Siban, Sarawak, in May, 1902.

Meagre as is de Geer's description, it contains all the salient points, I consider, for establishing the identity of *Pimpla bipartita* with his *Ichneumon rugosus*, since he describes it:—Of normal size with abdomen strongly elongate; head red with the eyes piceous; antennæ broken; thorax red. Abdomen subcylindrical and a little broader centrally, rugose and black; segments deeply discrete with very remarkable discal rugosities and incisions, rendering the surface uneven and rugose; terebra as long as the abdomen, with the spicula black and the valvulæ stouter, dark brown, apically obtuse and elongately pilose. Anterior legs red, and the hind ones entirely black; wings obscurely infumate throughout, opaque, with a slight violaceous reflection. He says, "J'ai lieu de croire que le seul individu que j'avois est originaire des Indes." Olivier adds that it is 17 millim. in length, with the antennæ black and shorter than the body; and that it occurs in Sumatra. Retzius simply quotes de Geer's diagnosis; but Gravenhorst in 1829 thought it possibly identical with *Ichneumon* (*Ephialtes*) *instigator*, Rossi (*nec* Fab.), which is incorrect; but for lack of all later reference to it, Dalla Torre, in 1901, left this species in *Ephialtes*, as inadequately described; de Geer's descriptions fortunately, however, very rarely fall into such a category.

131. **Hemipimpla ariana**, *Cam.* (Plate I, fig. 6.)

> *Pimpla ariana*, Cameron,* Manch. Mem. 1899, p. 157 (♀).
> *Erythropimpla ariana*, Cameron, Tijds. Ent. 1907, p. 99.

♂ ♀. A large black species, with the head and thorax bright red, and the wings flavescent. *Head* entirely red, transverse, and strongly constricted behind the prominent black eyes; occiput abruptly declivous, glabrous, somewhat impressed laterally and finely bordered posteriorly; ocelli infuscate and elevated upon a common plateau; frons glabrous, with the scrobes large and extending nearly to the ocelli; face deplanate and flavidous, with a few fine scattered punctures and rufescent hairs, centrally

subelevated longitudinally and discrete from the deplanate and apically impressed clypeus; mandibles not very stout, with the subequal teeth apically infuscate and subobtuse; cheeks distinctly shorter than the basal breadth of the mandibles; eyes very slightly emarginate next the scrobes. *Antennæ* black, two-thirds the length of the body, setaceous; scape entirely, and in ♂ flagellum beneath, rufescent; joints cylindrical and not elongate. *Thorax* bright red throughout, glabrous and very strongly nitidulous, with very sparse dark pilosity on the metathorax; notauli inconspicuous; metathoracic areæ entirely wanting, punctation obsolete; spiracles small, oval and directed towards apex. *Scutellum* glabrous and not convex, with a few dark hairs. *Abdomen* fusiform-cylindrical and broadest centrally, entirely dull black, strongly punctate throughout, with the apical angles of the segments prominent; basal segment distinctly longer than apically broad in both sexes, slightly narrowed basally, centrally elevated, strongly bicarinate and laterally scabrous; the four or five following segments deeply incised transversely at their apical third, the incision becoming laterally confluent with another, which rises obliquely from the depressed base; disc usually longitudinally subcarinate; basal ventral segments plicate; ♂ valvulæ retracted; terebra black, slightly longer than the abdomen, with the valvulæ slender and pilose, spicula black. *Legs* short and somewhat stout, red, with the hind pair alone entirely black; claws stout and strongly lobate, in ♀ hardly extending beyond the pulvilli; front tibiæ simple, their calcaria curved. *Wings* not broad, strongly flavescent, with their external margin broadly infumate in both sexes; radix, tegulæ, costa and stigma testaceous; areolet subpetiolate, oblique, and emitting the recurrent nervure from near its apex; lower wings with the first recurrent distinctly postfurcal and emitting the nervellus far below its centre; costa of ♂ flavescent throughout.

Length 14–17 millim.

Sikkim, v. & vi. 1900 (*Bingham*); Assam: Khasi Hills (*Rothney*, type), Naga Hills (*Bingham*), Margherita (Ind. Mus.).

This species is related to *Hemipimpla testacea* in the coloration of the wings and to *H. rugosa* in that of the body and legs; but from both it is at once recognised by the distinctly postfurcal recurrent nervure of the lower wings and more tumid basal segment. Unlike *H. testacea*, both sexes have the postpetiole bicarinate and the radius equally curved above the subsessile areolet; nevertheless I think no doubt can exist respecting the correctness of the sexes of the former, as here described. My description is drawn from one male and seven females in the British Museum.

Genus PHILOPSYCHE, *Cam.*

Philopsyche, Cameron, Spolia Zeylanica, 1905, p. 137.

GENOTYPE, *P. albobalteata*, Cam.

Eyes very large, extending to the base of the mandibles and distinctly emarginate internally, though not convergent anteriorly; face centrally carinate longitudinally and distinctly discrete from the not quite transverse and apically depressed clypeus. Apical flagellar joint as long as the two preceding united. "The sharp lateral ridges of the mesonotum do not extend on to the scutellum"; metathoracic spiracles circular; metapleural carinæ distinct and entire. Scutellum roundly convex. Abdomen and legs as in *Pimpla*; the latter with the claws slender, curved and simple; apical joint of hind tarsi about thrice as long as the penultimate. Areolet triangular, small and petiolate; transverse median nervure of fore wings placed immediately behind the transverse basal, almost interstitial; internal cubital nervure angled beyond its centre, with no trace of nervelet; first recurrent of hind wing intercepted far below its centre.

Range. Ceylon, Australia.

132. Philopsyche albobalteata, *Cam.*

Philopsyche albobalteata, Cameron, Spolia Zeylanica, 1905, p. 138, pl. B, fig. 10 (♂).

Charitopimpla annulipes, Cameron, *loc. cit.* p. 139, pl. B, fig. 9 (♀).

A black species, with the elongate pubescence, and most of the legs, white. ♂. *Head* smooth and nitidulous, with the face obscurely shagreened and covered with white pilosity, which is longer on the clypeus; palpi white. *Antennæ* with scape white beneath. *Thorax* with hind edge of pronotum white; mesonotum closely punctate, with elongate white pubescence; metanotum glabrous and nitidulous, with only its centre punctate and with elongate white pilosity; pleuræ smooth, subnude, except the metapleuræ above the lateral carinæ. *Scutellum* closely punctate, with elongate white pubescence. *Abdomen* closely and strongly punctate, with black pubescence: the glabrous apices of the six basal

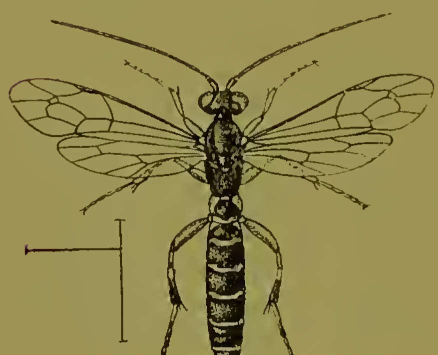

Fig. 45.
Philopsyche albobalteata, Cam.

segments white. *Legs*: anterior pairs white; hind pair with coxæ, femora and basal joint of the trochanters red, their black tibiæ broadly white in centre and narrowly at extreme base, the trochanterelli and the apex of the basal tarsal joint also white. *Wings* with tegulæ white.

Length 7–8 millim.

♀. A handsome black insect, with the legs and apical margins of the abdominal segments flavous, the hind coxæ and femora red, with their apices and the apex and centre of their tibiæ black, areolet elongately petiolate and the face longitudinally carinate.

Length 12 millim.

Ceylon: Matale and Peradeniya, from *Psyche albipes* and *P. subteralbata*, Yatyiantota, from *P. vitrea*, vi. 06, Badulla and Puwukpitiya, from miscellaneous Psychid cases, iv. 06, Pundaluoya and Madulsima, v. 07 (all *E. E. Green*).

The sculpture is identical in both sexes, and I cannot conceive how Cameron failed to associate them.

From an examination of the figure of the female (*loc. cit.*) I was at first of the opinion that it was synonymous with my *Exeristes albicincta*; but there are several pertinent points of distinction:—The edge of the pronotum is white, the abdominal bands are laterally fulvescent, the hind coxæ except below are red, the areolet is elongately petiolate, with the pedicle "as long as the branch of the first transverse cubital nervure," the face is centrally carinate, the apex of the clypeus is brunneous, the metanotal pilosity is more fulvous than that of the remainder of the thorax, the metapleuræ below the lateral carinæ are smooth, and, above all, the abdomen is closely punctate and the terebra, in proportion to the length of the body, decidedly shorter. Strangely enough the areolet is figured by Cameron as distinctly sessile, and the nervellus is not shown.

Mr. Green has been so good as to send me many specimens of this handsome species, the colouring of which is remarkably constant. Our oldest record of the insect is a female, in the Oxford Museum, taken by Thwaites in Ceylon in 1873.

Genus EXERISTES, *Först.*

Exeristes, Förster, Verh. pr. Rheinl. 1868, p. 164.
Charitopimpla, Cameron, Journ. Str. Br. R. As. Soc. 1902, p. 48.

Genotype, *Pimpla roborator*, Grav.

Eyes not or hardly pilose, nor internally emarginate; clypeus apically impressed in the centre, and basally distinctly discrete from the face. Apical flagellar joint not longer than the two penultimate. Mesonotum not transversely strigose, the lateral carinæ not reaching the scutellum; metathoracic spiracles oval and areæ entirely wanting. Abdomen not glabrous; the segments

transversely impressed, and the second not elongate; spicula apically straight. Apical joint of hind tarsi fully twice as long as the penultimate; claws not pectinate, those of ♀ strongly lobate basally. Wings with areolet entire; internal cubital nervure not pellucid; first recurrent of hind wings not straight throughout.

Range. Palæarctic and Nearctic Regions.

So far as the Indian species of this genus are at present concerned, it is composed entirely of females, with the single exception of one male, which is anything but satisfactorily placed here.

Table of Species.

1 (8) Terebra at least nearly as long as the abdomen.	
2 (5) Scutellum and abdominal petiole black.	
3 (4) Abdomen very distinctly pale-banded	*albicincta*, sp. n., p. 196.
4 (3) Abdomen not pale-banded	*tibialis*, sp. n., p. 198.
5 (2) Scutellum and abdominal petiole not black.	
6 (7) Areolet sessile; metanotum closely punctate............	*flavoscutis*, Cam., p. 198.
7 (6) Areolet petiolate; metanotum very sparsely punctate	*leucostoma*, Cam., p. 199.
8 (1) Terebra nearly always very distinctly shorter than abdomen.	
9 (10) Scutellum entirely black	*nigroscutis*, Cam., p. 200.
10 (9) Scutellum more or less broadly flavous.	
11 (12) Hind legs mainly black; abdominal pale bands not entire.	*flavipalpis*, Cam., p. 200.
12 (11) Hind legs mainly pale; abdominal pale bands usually entire.	
13 (16) Wings not apically clouded; mesonotum immaculate.	
14 (15) Frons centrally simple; wings hyaline throughout	*pulchella*, sp. n., p. 201.
15 (14) Frons centrally carinate; wings basally fulvescent	*carinifrons*, Cam., p. 202.
16 (13) Wings apically clouded; mesonotum with flavous stripes ..	*pulchrimaculata*, Cam., p. 203.

133. **Exeristes albicincta**, sp. n.

♀. A black species, with flavous markings and tricoloured legs. *Head* somewhat strongly constricted behind the eyes, black, with the vertical orbits narrowly and palpi stramineous; occiput obliquely declivous, ocelli brunneous, frons subglabrous, scrobes large; face centrally elevated though not carinate, sparsely

punctate and deeply discrete from the apically depressed and entirely immaculate clypeus; mandibles black and strong but not broad, with the apical teeth acuminate and of equal length; cheeks very short. *Antennæ* distinctly shorter than body, subfiliform, with the joints short and cylindrical; scape and pedicellus stramineous beneath. *Thorax* subparallel-sided, evenly punctate throughout, black, with a callosity before radix alone flavous; pronotum immaculate; mesonotum somewhat deplanate, notauli short but deeply impressed; metathorax with no trace of areæ, but with long sparse griseous pilosity with no fulvous tinge and the areolar region glabrous; sparsely punctate below lateral carinæ; spiracles nearly circular. *Scutellum* black, distinctly punctate and pilose, not convex. *Abdomen* cylindrical and parallel-sided, evenly but not at all closely punctate, nitidulous, black, with the apices of the five basal segments somewhat broadly, and of the two following very narrowly, stramineous and not laterally rufescent; basal angles of the second and third concolorous; all the segments apically glabrous; the first apically broader than long and discally subdeplanate; the second to fifth broadly, but not convexly, tuberculate on either side and triangularly impressed discally; venter testaceous and plicate throughout; terebra a little longer than the abdomen, with the valvulæ black and but shortly pilose. *Legs* not elongate, pale stramineous, with all the tarsal claws small and blackish, strongly lobate basally; hind legs with the coxæ entirely, base of trochanters, apices of tibiæ and of femora, and a band before the base of the former, black; hind femora red, their tarsi only apically infuscate. *Wings* normal and hyaline; radix and tegulæ stramineous; costa and stigma black; areolet somewhat small, exactly triangular, shortly petiolate and emitting the recurrent nervure from very near its apex; lower wings with first recurrent subopposite and nearly straight, emitting the straight nervellus from distinctly below its centre.

Fig. 46.
Exeristes albicincta, Morl.

Length 14–15½ millim.

Sikkim, iv. 91 and iv–vi. 1900 (*Bingham*).

Type in British Museum.

Very like *Philopsyche albobalteata*, but larger, with the abdomen sparsely punctate and the terebra longer.

134. **Exeristes tibialis**, sp. n.

♀. A black species, with the central segments badious, and the legs, propleuræ and scape mainly flavous. *Head* nitidulous, very finely and extremely sparsely punctate; vertex convex and not buccate behind the entire eyes, which extend almost to the base of the piceous and equally strongly bidentate mandibles; occiput absolutely bordered laterally, and strongly emarginate in the centre; face nitidulous, obsoletely punctate, with dense long white pilosity; clypeus strongly discrete and four times as broad as long. *Antennæ* filiform throughout and black, with the scape excised nearly to its base and broadly flavous beneath. *Thorax* distinctly, evenly and not closely punctate, with the pleuræ and sternum subglabrous; propleuræ triangularly above, and an elongate callosity before the radix, stramineous; notauli distinct, though hardly reaching centre; metathorax with no area, but with long pilosity, lateral carinæ entire, spiracles small and circular. *Scutellum* normal and somewhat deeply punctate. *Abdomen* double the length of the thorax, convex, subparallel-sided, with the apices of the evenly and distinctly punctate segments a little prominent; basal segment not longer than apically broad, bicarinate to the centre, with the emarginate apex centrally elevated; second segment quadrate and, with the slightly transverse third, conspicuously badious before its apex; fourth and fifth distinctly tuberculate and subtransverse, with the following smoother and much shorter; venter flavidous and plicate; terebra five-sixths the length of the body with the spicula ferruginous, the valvulæ black and very elongately pilose. *Legs* fulvous with the anterior coxæ, and all the trochanters, stramineous; hind coxæ and tibiæ stramineous above and blackish throughout beneath; calcaria pale, slender and very short; claws curved, small and basally strongly lobate. *Wings* hyaline, with the radix and tegulæ flavous, stigma and costa blackish; areolet triangular, broader than high, and emitting the distinctly bifenestrate second recurrent nervure from its apical third; first recurrent of hind wing distinctly postfurcal, emitting nervellus from above its centre.

Length 13 millim.

SIKKIM, iv. 91 and iv. 1900 (*Bingham*).

Type in British Museum.

I have seen a second female of this species of eleven millimetres in length with the abdomen immaculate, the scape only apically testaceous beneath, and the hind coxæ not infuscate.

135. **Exeristes flavoscutis**, *Cam.*

Charitopimpla flavoscutis, Cameron, Tijds. Ent. 1907, p. 97 (♀).

A black species, with pale flavescent markings. *Head* smooth; face, excepting a central black line attenuated above, and the base of the mandibles, pale flavous. *Thorax* with pro- and meso-

thorax smooth and shining; a narrow pronotal line, callosities at radices and an irregular central mark at base of the mesopleuræ, pale flavous; metathorax with long pale hairs, closely and strongly punctate, except at the centre and apex of metanotum. *Scutellum* and postscutellum, except a longitudinal line on basal half of the former, pale flavous. *Abdomen* rufo-testaceous, with the six basal segments closely and strongly punctate; a broad line posteriorly dilated centrally at the apex of the first segment, a broader line extending nearly to the centre and subdilated centrally and laterally on the second, narrower lines on the third and fourth segments, and the two apical segments entirely, black; terebra not quite as long as abdomen (6 millim.). *Legs*: anterior pairs pale flavous with the femora testaceous behind; hind legs rufo-fulvous throughout. *Wings* hyaline, with the stigma and nervures black; tegulæ pale flavous; areolet oblique and sessile, emitting the recurrent nervure from its apex.

Length 11 millim.

SIKKIM (*Bingham*).

Unknown to me.

136. Exeristes leucostoma, *Cam.*

Charitopimpla leucostoma, Cameron, Tijds. Ent. 1907, p. 97 (♀).

♀. A black species, with stramineous markings. *Head* smooth, with fulvous pubescence; face, except a line on its apical two-thirds, clypeus, except a large apical piceous mark, mandibles, except at apex, and the palpi, stramineous. *Antennæ* with the two basal joints flavous beneath and the flagellum with dense stiff pale pubescence. *Thorax* smooth, with fulvous pubescence; a line on the apical half of the pronotum and the radical callosities stramineous; metathorax sparsely punctate, except at the centre and apex of the metanotum. *Scutellum* and postscutellum stramineous. *Abdomen* strongly and closely punctate with the anus smooth; central segments laterally flavescent; the four basal segments rufo-testaceous with the apices of the second to fourth narrowly black; remaining segments black, with the apex of the sixth, most of the seventh and two transverse spots on the fourth, pale flavous; terebra as long as the abdomen (5 millim.). Anterior *legs* pale flavous, with the femora somewhat darker. *Wings* hyaline, with the nervures and stigma black; tegulæ stramineous; areolet shortly but distinctly petiolate.

Length 9 millim.

SIKKIM (*Bingham*, type); CEYLON: Kandy, vii. 09 and ii. 10 (*E. E. Green*, *O. S. Wickwar*).

In the three Ceylon specimens the head and thorax are very strongly nitidulous and very sparsely, though distinctly, punctate and pilose, with the notauli fine; the scrobes are large and extend nearly to the ocelli; the face is exactly quadrate and, like the very strongly discrete clypeus, entirely pale stramineous; the cheeks

are obsolete and the deplanate mandibles mainly whitish; the metathoracic spiracles are circular and somewhat large, the metanotum is evenly convex, with large punctures and no carinæ; the abdomen is strongly punctate throughout, with conspicuous tubercles; the basal segment is hardly longer than broad, with the sides margined but the disc not carinate; the four basal segments, except the apices of the apical three, are entirely bright castaneous, with no flavous tinge; the sixth and seventh segments alone are apically broadly, and the anterior legs entirely, pale stramineous; the tarsal claws are strongly lobate; the second recurrent nervure emitted from the apex of the strongly oblique areolet, and the basal is subcontinuous through the median.

137. **Exeristes nigroscutis**, *Cam.*

Charitopimpla nigroscutis, Cameron, Tijds. Ent. 1907, p. 98 (♀).

A black species, with immaculate scutellum. *Head* smooth and shining; face except a broad line attenuated above on its apical two-thirds, base of the mandibles, and the palpi, pale flavous. *Antennæ*: flagellum with short, stiff, dense pubescence. *Thorax* smooth and shining, with a short line on apex of the pronotum pale flavous; metathorax less closely punctate laterally. *Scutellum* distinctly, but not closely, punctate, black. *Abdomen* closely and strongly punctate, with the anus subglabrous; the four basal segments rufo-testaceous, with the apices of the second to fourth and the anus black, and the apices of the sixth and seventh narrowly flavous; terebra shorter than abdomen and about half the length of the body (5 millim.). *Legs*: anterior pairs pale flavous, with a fulvescent tinge; hind pair rufo-fulvous throughout. *Wings* hyaline, with the nervures and stigma black; tegulæ pale flavous; areolet small, triangular, oblique and shortly petiolate, emitting the recurrent nervure from its apex.

Length 10 millim.

SIKKIM (*Bingham*).

Unknown to me.

138. **Exeristes flavipalpis**, *Cam.*

Pimpla flavipalpis, Cameron,* Manch. Mem. 1899, p. 174 (♂ ♀).

♂ ♀. A black, white-marked species, with the legs mainly red, coxæ variegated and wings hyaline. *Head* nitidulous; the frons excavate, centrally glabrous, with short white lateral pubescence; the lower ocellus bordered with an irregularly crenulated furrow from which a narrow smooth one extends to the scrobes; face strongly and closely punctate, densely white-pilose, with the epistoma glabrous, nitidulous and subprominent; mandibles closely rugose basally, palpi flavous. *Antennæ* slender and black, with

the scape flavous beneath and closely punctate. *Thorax* black, with a narrow line on the pronotum, two elongate tuberculiform lateral marks on the metathorax from its centre to apex, and the apophyses, flavous; mesonotum glabrous and nitidulous; metathorax closely and transversely strigose, more finely and closely at base and apex; mesopleuræ closely punctate, apically rugulosely crenulate; metapleuræ coarsely punctate above, apically substrigose. *Scutellum* and postscutellum with flavous markings. *Abdomen* closely punctate, obsoletely at base of petiole and anus; black, the apices of the three basal segments with a subtriangular flavous mark; the fourth with a laterally dilated band, and the remainder with large lateral marks, flavous; venter with broad stramineous bands; terebra 2 millim. in length. *Legs* red, with the coxæ and trochanters black and broadly flavous-marked; hind tibiæ, tarsi and apices of their femora black, the first with a stramineous band near the base. *Wings* hyaline and basally subinfuscate; stigma and nervures black; areolet oblique and subpetiolate, emitting the recurrent nervure from its apical third.

Fig. 47.—*Exeristes flavipalpis*, Cam.

Length 7–11 millim.

Assam: Khasi Hills (*Rothney*).

Types ♂ ♀ in the British Museum.

The anterior legs of the ♂ are paler, with the coxæ entirely flavous, and its white abdominal marks are laterally larger and continued across the sides. The abdominal coloration and the size are variable in both sexes.

The position of the present species is a little obscure; the types were subsequently referred by their author to the genus *Chrysopimpla*, but I am not persuaded that they are not better placed in *Itoplectis*, Först.

139. **Exeristes pulchella**, sp. n. (Plate I, fig. 7.)

♀. A pretty black and yellow species, with entirely pale legs. *Head* strongly constricted behind eyes; occiput nitidulous, very finely and sparsely punctate and pubescent, finely bordered posteriorly; frons concave, with the scrobes ill-defined and not large; face flat, somewhat dull, sparsely punctate, with obsolete pubescence, entirely white, with the epistoma alone brunneous; clypeus very strongly and circularly separated, white, with the apex emarginate, deeply impressed and rufescent; mandibles

blackish, the teeth subobtuse, the upper being a little the longer; all the palpi flavidous, cheeks almost wanting. *Antennæ* subfiliform, hardly longer than half the body, black with the scape white, and basal flagellar joints rufescent beneath. *Thorax* black, shining and somewhat short; mesonotum obsoletely punctate with no trace of notauli, a line beneath the radix and an elongate one before it stramineous; metathorax finely and not closely punctate with griseous pubescence, lateral costæ alone traceable; spiracles nearly circular and directed upwards. *Scutellum*, postscutellum entirely, and frenum very narrowly, bright flavous. *Abdomen* subparallel-sided, black, with the whole of the first segment and the three following broadly in the centre fulvous, anus white; basal segment not longer than apically broad, discally strongly punctate, centrally sulcate and elevated on either side; the following segments (except at apex) evenly and somewhat strongly punctate, the second with small, and the next two with large, though not convex, lateral tubercles; terebra black and of the same length as the abdomen, with the valvulæ not strongly pilose. *Legs* flavous, with all tarsal claws infuscate and basally lobate; hind legs, except trochanters and base of tibiæ, fulvous; calcaria of equal length and one-third of metatarsus. *Wings* normal and hyaline; radix and tegulæ stramineous, costa and stigma piceous; areolet subsessile, broadly triangular and emitting the recurrent nervure almost from its apex; first recurrent of lower wings opposite and emitting the nervellus distinctly below centre.

Length 10 millim.

SIKKIM, iv.–vi. 1900 (*Bingham*, type); ASSAM (*W. F. Badgley*). *Type* in the British Museum.

The Assam specimen, in the British Museum, has the second to fourth abdominal segments but narrowly pale before their apices.

140. Exeristes carinifrons, *Cam.*

Pimpla carinifrons, Cameron,* Manch. Mem. 1899, p. 172 (♀).

♀. A handsome black species, with the scutellum and most of the legs flavous, and the abdomen white-banded. *Head* black, with the palpi stramineous; face strongly punctate, with the epistoma obtusely carinate and centrally glabrous, pilosity white and silky; clypeus, except its strongly punctate base, smooth and remarkably excavate; frons broadly and somewhat deeply concave, apically glabrous, obscurely shagreened above and stoutly carinate longitudinally in the centre; inner orbits distinctly margined; mandibles basally strongly punctate. *Antennæ* black, the scape with long pale hairs; flagellum densely clothed with short, stiff, black pubescence. *Thorax* black throughout; mesonotum minutely punctate, with dense short infuscate pubescence; metathorax broadly elevated centrally, its centre strongly trans-strigose and the sides more closely and finely striate, the base glabrous and

centrally nitidulous; propleuræ strongly shagreened and finely strigose towards their apices; mesopleuræ sharply carinate basally, broadly and obliquely elevated centrally, closely punctate, basally canaliculate and feebly punctate, with the upper part at the apex glabrous and the lower finely and closely striate longitudinally, the extreme apex glabrous behind the crenulation; metapleuræ closely and longitudinally strigose, becoming stronger apically. *Scutellum* flavous and slightly incised roundly at its apex, with large scattered punctures on its basal slope, and strong rugose ones on its oblique apical slope; postscutellum basally oblique, centrally nitidulous and obsoletely strigose, with its lateral impressions broad, deep and obscurely crenulate. *Abdomen* black, banded with white; first segment strongly punctate basally, distinctly aciculate laterally, with the following segments closely and uniformly punctate; petiole centrally and subdivergently biplicate below at the base, and finely strigose transversely at the apex; terebra 3 millim. in length. *Legs*: anterior pairs stramineous, the base of the front coxæ, the intermediate coxæ and base of their trochanters, excepted; hind legs black, with a broad band before base of their tibiæ stramineous. *Wings* uniformly fulvescent-hyaline; stigma and nervures piceous; areolet oblique, coalescent above, emitting recurrent nervure beyond its centre; radius apically reflexed; nervellus intercepted at its upper fourth.

Length 15 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the British Museum.

Cameron is a little vague respecting the coloration of the wings and legs; the former he at first terms *fusco-hyalinis*, presumably throughout, and later "hyaline, the basal half suffused with fulvous," which is a strange combination; of the legs he says *pedibus anterioribus basique tibiarum posticarum late flavis*, but later "the hinder legs black, except the basal half": nor are colour details of the abdomen, which is wanting in the type, indicated.

141. **Exeristes pulchrimaculata**, *Cam.*

Pimpla pulchrimaculata, Cameron,* Manch. Mem. 1897, p. 20 (♀).

♀. Black and broadly flavous-marked. *Head* glabrous and nitidulous, flavous, with the occiput broadly, the frons transversely and a band connecting it with the concolorous ocellar region, black; palpi testaceous. *Antennæ* immaculate and nearly as long as the body. *Thorax* black; pronotum with a narrow flavous border and the propleuræ basally concolorous; mesonotum with two central and gradually dilated stripes, extending from the radices to the anterior margin, flavous; a large mark on the mesopleuræ, constricted below, flavous; mesosternum flavous before the intermediate coxæ; metathorax laterally broadly and sinuately, and the apophyses, flavous, with a centrally constricted discal black

longitudinal fascia; metapleuræ flavous, with an oblique black line to the spiracles. *Scutellum* except apically, and postscutellum, flavous. *Abdomen* black; basal segment glabrous and nitidulous, with a broad central pale band, terminating before the apex in a broad semicircle; remaining segments closely punctate, with the anus brunneous; second to fourth segments distinctly and obliquely impressed, the former also with its basal angles broadly impressed, beyond which it is flavous. *Legs* fulvous; coxæ flavous, with the hind ones broadly in front and more narrowly behind contiguously black-marked. *Wings* hyaline, with an apical violaceous mark, extending from the costa (metacarpus) to about the same distance below the cubital (? radial) nervure, the external half of which is curved; areolet oblique and shortly petiolate.

Length 14 millim.

CEYLON: Trincomali (*Col. Yerbury*).

Type. Location unknown.

It is really impossible to tell from the above description, taken direct from that of Cameron (*loc. cit.*), to what position to assign this species, since the bare structural features indicated are the smooth and shining head and basal segment, the antennæ are vaguely nearly as long as the body, the remainder of the abdomen closely punctate and transversely impressed with the basal angles of the second segment obliquely incised, the areolet oblique and subpetiolate, and the (?) cubital nervure apically sinuate. The profusely-described coloration possibly allies it to this genus. A specimen in the British Museum, labelled type by its author, bears no resemblance to the description and is a *Xanthopimpla*.

Genus **MIOPHATNUS**, *Cam.*

Miophatnus, Cameron, Tijds. Ent. 1907, p. 105.

GENOTYPE, *M. nigromaculatus*, Cam.

Eyes large and parallel; cheeks distinct; clypeus obliquely depressed apically, transverse; labrum large and rounded; temples roundly narrowed. Antennæ longer than body, densely covered with stiff, erect hairs. Metanotum coarsely, irregularly and transversely striate, except at its base, where it is punctate, and at its apex, where it is subglabrous; metapleural carinæ narrow and distinct. Abdomen with basal segment smooth, shining and of equal width throughout. Legs elongate, with the tarsal claws simple. Areolet large, broad, not constricted anteriorly, pentagonal, emitting the recurrent nervure in its centre; the transverse median nervure received behind the transverse basal; first recurrent of hind wings intercepted shortly below its centre; inner cubital of front ones entire.

Range. Sikkim.

Cameron remarks (*l. c.*) that the areolet is as in the CRYPTINÆ rather than the PIMPLINÆ, and one must consequently suppose that he inserted this genus in its present position on the con-

formation of the basal segment, which is but vaguely described. In Ashmead's arrangement (Proc. U. S. Nat. Mus. 1900), this genus is said by its author to come in near *Trevoria*, in fact there is nothing in Cameron's description, given above, to exclude it therefrom, except that he places it in the PIMPLINI, and *Trevoria* is considered by Ashmead to belong to the LISSONOTINI. If one admits ICHNEUMONIDÆ with the areolet pentagonal into the PIMPLINÆ, it becomes in a very great many instances extremely difficult to draw the line between that subfamily and the CRYPTINÆ, since the only remaining character of value must be sought in the sessility of the abdomen, a feature of such infinitely minute and numerous modifications in various genera as to be simply bewildering. I allow *Miophatnus* to remain here, however, since the basal segment appears to be unusually sessile and, in its case, no doubt seems possible respecting its location.

142. **Miophatnus nigromaculatus**, *Cam.*

Miophatnus nigromaculatus, Cameron, Tijds. Ent. 1907, p. 105 (♂).

A pale sulphur-yellow species, with black markings. *Head* with the apices of the basally distinctly punctate mandibles, centre of frons and occiput broadly and continuously, black; face distinctly punctate. *Antennæ*, except the underside of scape, black. *Thorax* with the closely and somewhat strongly punctate mesonotum basally and laterally, and an irregular band on the centre of metanotum, broadly black; the latter with elongate and infuscate pilosity, the striations stout, centrally sinuate and becoming laterally reticulate; propleuræ smooth, mesopleuræ irregularly punctate below and obsoletely aciculate centrally, metapleuræ strongly but not closely punctate. *Scutellum* somewhat sparsely punctate, apically with the postscutellum entirely black. *Abdomen* with the base of all the segments, more than the basal half of the three first, black; second and third segments closely but not strongly punctate. *Legs* fulvous and paler basally, with the apices of the hind coxæ broadly and irregularly black, as are also the posterior tarsi. *Wings* hyaline, with the stigma and nervures blackish.

Length 13 millim.

SIKKIM (*Bingham*).

Unknown to me.

Genus **POLYSPHINCTA**, *Grav.*

Polysphincta, Gravenhorst, Ichn. Eur. iii, 1829, p. 112.

GENOTYPE, *Ichneumon percontatorius*, Müll.

Head shortly transverse, usually nitidulous, not buccate, but generally distinctly narrowed posteriorly; frons deplanate and slightly impressed above the antennæ; eyes prominent and oval,

more or less emarginate next the scrobes; face subprotuberant and narrower than the frons, a little constricted towards the mouth; cheeks short and not at all buccate; clypeus discrete, convex, apically broadly rounded and usually finely margined though not impressed; mandibles somewhat narrow and gradually dilated basally, with the lower tooth usually somewhat the shorter; maxillary palpi subelongate, with the three apical joints subequal in length. Antennæ short or of normal length, slender and filiform, though slightly attenuate apically; scape nearly entire apically or a little excised externally at the apex; basal flagellar joint somewhat elongate, cylindrical, and the apical one conical, sometimes double the length of the penultimate. Thorax gibbulous, longer than high, and narrower than the head; pleuræ smooth and nitidulous; epomia distinct; mesonotum ovate, with distinct apical notauli; metathorax with the areæ complete, obsolete or wanting; areola sometimes finely delineated, petiolar area very small and often entire; spiracles circular and minute. Scutellum subquadrate or subtriangular, apically obtuse and a little convex. Abdomen sessile, or rarely subsessile, as broad as, and twice as long as the thorax, oblong or cylindrical; epipleuræ subobsolete; basal segment either subquadrate or a little longer than broad, rarely basally subconstricted, more or less distinctly bicarinate and transversely impressed before the apex, with the tubercles near the base; segments two to four or five transversely impressed and tuberculate, with the elevations nitidulous, and more or less punctate: the sixth and seventh of ♀ with the venter longitudinally cleft; terebra normally or shortly exserted, never longer than the abdomen and rarely longer than its half; spicula strongly acuminate, with the valvulæ elongately pilose. Legs normal or slender, with the femora somewhat stout; apical joint of the hind tarsi usually dilated, longer and broader than the penultimate, with the claws stout, and in ♀ basally lobate; the hind tibiæ longer than their femora, with short and subequal calcaria. Wings normal or ample; areolet wanting or obsolete, never entire; radial cell sublanceolate; first recurrent of lower wings either slightly curved and not intercepted, or distinctly bent and emitting a more or less distinct nervellus.

Range. Ceylon, Europe, North America, Venezuela.

The genus was originally distinguished from *Pimpla*, which it resembles in facies, by the lack of the areolet. Holmgren found, however, that, although it resembled *Pimpla* in the abdominal conformation, the terebra was as a rule shorter, and the clypeus, besides being more convex, was not, or very rarely deflexed, never impressed, though very often margined before its apex.

The species of this genus appear to be almost or quite exclusively ectoparasites of the *Arachnida*, and several very interesting and economically important notices have been published respecting their development. In spite of what Ratzeburg and Howard ('Insect Life,' 1888, p. 42) have said to the contrary, we may, I think, assume, that it is invariably the spiders themselves,

and neither their eggs nor their webs, which are attacked by *Polysphincta*.

I cannot pretend to describe the insect figured by Green ('Science Gossip,' 1888, p. 160, ♀), since it is evidently distinct from that brought forward by Ashmead, and appears from its neuration to belong to *Acrodactyla*, though it has been referred to Förster's subgenus *Zatypota* ('Insect Life,' 1895, p. 279). This figure represents the imago magnified, thus described:—"Colour black; a reddish patch upon the thorax; scutellum and attachment of wings yellowish. Antennæ multiarticulate, basal joint reddish. Legs yellowish, tarsi of hind pair and terminal joints of first and second pairs blackish. Wings covered with minute hairs. Segments of abdomen with symmetrical rounded prominences."

Length 5 millim.; expanse $9\frac{1}{2}$ millim.

It appears to be common in Ceylon, where "the spider usually attacked" is said by Dr. Marx to belong to the genus *Chrisso*. Camb.; and the females alone fall victims on account of their larger size. "The egg is fixed to the abdomen of the spider close to its junction with the cephalothorax." The larva occupies forty-eight hours in cocoon-spinning, after devouring the spider.

But one Indian species has yet been described.

143. **Polysphincta ceylonica**, *Ashm.*

Polysphincta ceylonica, Ashmead, Proc. U.S. Nat. Mus. 1896, p. 645 (♀).

♀. Black, glabrous, and strongly nitidulous. *Head*: palpi and mandibles white. *Antennæ*: scape red beneath. *Thorax*: mesopleuræ red; metanotum longitudinally bicarinate in the centre. *Scutellum* red. *Legs* white, with a spot at apices of the hind tibiæ and their tarsi, except the first joint towards its base, infuscate. *Wings* hyaline; tegulæ white; stigma and nervures piceous.

Fig. 48.
Polysphincta ceylonica, Ashm.

Length 4 millim. (*Ashmead*).

I may add that the mesosternum is also dull rufescent, the scutellum unusually convex, the antennæ strongly pilose, the basal segment but slightly longer than apically broad and strongly bicarinate discally throughout, with the following segments crenulately trans-impressed before their elevated apices, the hind tibiæ are not always apically infuscate, and the distinctly reflexed and pilose terebra is shorter than the basal segment.

CEYLON: Pundaluoya (*E. E. Green*).

Type in the United States National Museum.

Ashmead thus shortly describes a single female, reared from an unspecified spider at Pundaluoya, in Ceylon; he adds that it is type No. 3266 in the United States National Museum, which is a necessary observation, considering the paucity of his description. I have, however, seen a single female agreeing in every way with such points as are indicated; it was bred from a larva preying externally upon a spider in Ceylon by Mr. Green, who also sent me the very slight cocoon of brown strands on a grass stem, whence the imago emerged. It is a similar species, especially in the remarkable distance at which the second recurrent is emitted from the obsolete transverse submarginal nervure, to *P. tuberosa*, Grav., though much smaller, with the abdomen less linear, the terebra shorter and the legs paler.

Genus **CÆNOPIMPLA**, *Cam.*

Cænopimpla, Cameron, Manch. Mem. 1900, p. 99.
(?) *Neopimpla*, Ashmead, Proc. U.S. Nat. Mus. 1900, p. 56.

GENOTYPE. *C. ruficollis*, Cam.

Clypeus not discrete from face; mandibles unidentate, with the tooth acuminate and somewhat elongate. Notauli distinct and deeply impressed; metathorax clearly and completely areated; areola longer than broad and laterally oblique at its base; spiracles small and circular; metapleuræ strongly rugose; mesonotum finely trans-strigose anteriorly. Scutellum slightly convex, rugosely punctate, and apically constricted, with its side carinate. Abdomen longitudinally striate, broadly and transversely impressed, with the fifth segment centrally carinate; basal segment laterally carinate above and below, centrally elevated and bicarinate, with the spiracles exactly in the centre, subimpunctate. Legs normal, with the claws simple, the front tarsi basally incised, and the hind trochanters and tibial bases white. Wings transversely bifasciate; external nervure of areolet wanting, the interior short; the internal cubital sharply and obliquely sloped before areolet; basal and apical abscissæ of radius oblique; basal nervure pellucid; stigma large.

Range. Assam; ? Africa.

"A distinct and somewhat isolated genus. It is easily known by the absence of an areolet, by the parapsidal furrows, and by the areolated metathorax. Its general coloration, form, and spotted wings, give it the appearance of a *Hemiteles*" (Cameron, *l. c.*). *Neopimpla*, as shortly diagnosed in Ashmead's table (*l. c.*), appears to differ in nothing but its oval or elliptic metathoracic spiracles; the terebra is shorter than the abdomen and the areolet wanting; the eyes are nude and internally hardly emarginate; it is recorded from Africa, but the species are not described. As remarked above, the type strongly resembles

members of the Cryptid genus *Hemiteles*, especially in the formation of the areolar nervures; the rugose abdomen, with its broad and centrally spiraculate basal segment, however, renders a position in the PIMPLINÆ more natural.

144. **Cænopimpla ruficollis**, *Cam.*

Cænopimpla ruficollis, Cameron,* Manch. Mem. 1900, p. 99 (♂).

♂. A small black species, with the thorax partly red, the anterior legs testaceous and the wings bifasciate. *Head* immaculate black; face and clypeus closely and rugosely punctate, with short white pilosity; clypeus apically rounded, depressed and margined; mandibles piceous, with their centre, like the elongate palpi, flavescent. *Antennæ* black and densely clothed with short stiff black pubescence; scape brunneous. *Thorax* red, with its sternum, mesopleuræ below, and the metathorax black; mesonotum closely, and metathorax distinctly, punctate; pro- and meso-pleuræ closely punctate and centrally strigose, with the latter apically glabrous above; metapleuræ strongly rugose. *Scutellum* red. *Abdomen* black, with the apices of the two basal segments, and dense anal pilosity, white; central petiolar carinæ not extending to apex, with the sides finely punctate; transverse impression of fourth segment broader and more strongly sinuate than that of the third; that of the fifth broad and sinuate. *Legs* black, with the anterior, except at coxal base, testaceous; hind trochanters and base of tibiæ white. *Wings* hyaline, with an infuscate fascia extending across the disc from the base of the basal nervure and a second, a little broader, across the disc from near the base of the infuscate stigma.

Length 5 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Genus GLYPTOPIMPLA, gen. nov.

In order to define this genus it is only necessary to say that I here erect it for the reception of insects agreeing in every way with those of the genus *Glypta*, Grav., excepting in the possession of the alar areolet, and, perhaps, but to a much lesser degree, distinct mesonotal notauli. No satisfactory subdivision of the genus *Glypta*, which could conscientiously be regarded as generic, has yet been enunciated (with the possible exception of *Conoblasta* and *Diblastomorpha*, Först., distinct solely in the possession of one or two frontal horns respectively), and it seems hardly desirable to expand a genus, one of whose principal features has ever been the lack of an areolet, to include also the following insect, which, discovered in a very little worked district, may be shortly followed by many congeners; for such an assembly would render *Glypta*, with its present 125 species, utterly unwieldy.

The areolet in this genus resembles that of *Lissonota*, rather than that of *Pimpla*, but I have adopted the shorter name.

145. **Glyptopimpla prima**, sp. n.

♂. A linear, black and flavous species. *Head* posteriorly narrow, with no frontal horn; black, with the clypeus and, except at their apices, mandibles flavous. *Antennæ* filiform, as long as the body; black, with the scape internally convex and flavous. *Thorax* with distinct mesonotal notauli; black, with the prosternum, sides of mesosternum, an elongate line before and a dot below the radices, and the apophysal areæ narrowly, flavous; metanotum distinctly and not very closely punctate, centrally bicarinate and emitting costulæ at its centre; apophyses wanting petiolar area very short, with its basal carina strongly elevated; spiracles small and circular. *Scutellum* deplanate and black, with its sides and apex broadly, and the postscutellum, flavous. *Abdomen* parallel-sided, dull and black, with the apices or apical angles of the posterior segments indistinctly flavescent; basal segment discally bicarinate to near its apex, with the following segments sulcately and triangularly impressed; venter flavous, with the three basal segments plicate. *Legs* slender and flavous, with only dots at the apices of the hind trochanters and femora, at apex and before base of their tibiæ, and the whole hind tarsi, infuscate; claws finely pectinate. *Wings* hyaline and not broad, with the areolet entire and petiolate; nervellus intercepted near its bottom.

Length 7 millim.

SIKKIM: Kurseong, 5000 ft., viii. 08.

Type in Indian Museum.

I have only seen the type of this species, but the areolet is so regular in its conformation and symmetrical in both wings that it can hardly be an aberration.

Genus GLYPTA, *Grav.*

Glypta, Gravenhorst, Ichn. Eur. iii, 1829, p. 3.

GENOTYPE, *G. teres*, Grav.

Head distinctly transverse, more or less strongly contracted behind the oval eyes; frons sometimes with cornigerous excrescences, vertex narrow; clypeus convex, apically rounded or subtruncate, sometimes densely pilose apically and nearly always indistinctly discrete from the usually prominent epistoma; genal costa continuous. Antennæ slender and filiform, about the length of the body. Thorax stout and gibbulous; notauli indistinct; metathoracic areæ complete, obsolete or wanting; petiolar area semicircular, usually entire, but with the basal carina sometimes deficient; apophyses obsolete, spiracles small and subcircular. Scutellum convex and triangular, apically obtuse, and rarely pale-

marked. Abdomen sessile, dorsally deplanate and somewhat shining, linear or sublanceolate, with the three apical segments becoming gradually narrower; often centrally, or with the central segments apically, red; basal segment a little curved, laterally margined, with more or less elongate and evident discal carinæ, and spiracles close to its base; second to fourth segments with epipleuræ inflexed and always with two oblique and linear impressions, rising from the apical angles and coalescing at or converging towards the centre of the base; apical ventral segment incised apically and not retracted; terebra varying from a little shorter than the abdomen to much longer than the body; valvulæ of ♂ incrassate and apically obtuse, rarely narrower with the apex subacuminate. Legs somewhat slender, nearly always with the hind femora red, their tibiæ very often black, and white at the base; hind calcaria of unequal length; fifth tarsal joint usually longer than the fourth, their claws generally sparsely and finely but distinctly pectinate, sometimes simple. Wings somewhat narrow and not large, with no areolet; first recurrent nervure of hind wings intercepted below the centre.

Range. Europe, North and South Africa, Malay Archipelago, Japan, North America, Chile, Himalayas.

This genus is instantly known by the very conspicuous oblique abdominal impressions, a feature found also only in *Lycorina*, Holmg., and the following genus *Apophua*, among ICHNEUMONIDÆ. Similar linear impressions are found in the genus *Bassus*, etc., but in that case they are directly transverse and not duplicated as in the present genus.

Table of Species.

1 (2) Second and third abdominal segments not discally carinate . . . . *nigrina*, Desv.

2 (1) Second and third abdominal segments discally carinate . . . . *tricarinata*, Cam.

146. Glypta nigrina, *Desv.*

Glypta nigrina, Desvignes, Cat. p. 74 (♀); Bridgman, Trans. Norfolk Soc. v, p. 71; Morley, Ichn. Brit. iii, p. 161 (♂ ♀).

Glypta flavipes, Desvignes, Cat. p. 75 (♂); Bridgman, Ent. Mo. Mag. 1890, p. 208 (♀).

Glypta nursei, Cameron,* Journ. Bombay Nat. Hist. Soc. xiv, 1902, p. 425 (♂).

♂ ♀. An entirely black species, with the legs, clypeus, and anteradical callosities pale. *Head* constricted behind the eyes, black, with the clypeus, mandibles, and palpi bright flavous; face with long and dense, clypeus with very short, silvery pubescence; fronss imple; epistoma not prominent, nor clypeus discrete; cheeks as long as width of mandibles at base. *Antennæ* as long as the body, shorter in ♀; scape infuscate, of ♂ sometimes flavous beneath; flagellum black, fulvous or rufescent, and often

pale testeceous beneath. *Thorax* black, with an often elongate flavous callosity before the radix, notauli wanting; metathorax convex, distinctly and not very closely punctate, with all the areæ distinct; areola elongate, hexagonal, and emitting distinct costulæ from its centre; petiolar area subvertical, very short and distinctly carinate basally; pleuræ punctate and nitidulous. *Scutellum* immaculate and evenly punctate, with its frenum and that of the postscutellum usually flavescent. *Abdomen* punctate and shining, as broad as metathorax, black, with the oblique impressions deep; second and third segments subquadrate, and apically often obscurely rufescent; the fifth and following nitidulous; carinæ of the elongate basal segment of variable extent, often nearly reaching its apex, which is obtusely angled; terebra a little shorter than the abdomen. *Legs* fulvous, hind ones red; anterior coxæ and trochanters of ♂ flavous; bases of the apically subinfuscate hind tibiæ, and sometimes of the darker tarsal joints, obscurely white; fifth hind tarsal joint a little longer than the fourth. *Wings* with the stigma testaceous or ferruginous, radix and tegulæ pale; first recurrent of lower wing opposite and intercepted at its lower third.

Fig. 49.—*Glypta nigrina*, Desv.

Length 8–9 millim.

Punjab: Simla, 7000 ft., ix. 98 (*Col. Nurse*); Sikkim: Rungarum, 5700 ft., iv. & v. 1900 (*Col. Bingham*), Darjiling, 6000 ft., ix. 08 (*E. Brunetti*—Ind. Mus.).

Type in Col. Nurse's collection.

Col. Nurse has allowed me to examine the male, described by Cameron, and no doubt can remain respecting the synonymy; and there is another, purporting to be the type, from the same locality, in the British Museum. Three identical males, in the British Museum, taken by Col. Bingham at Rungarum, differ in nothing but their darker antennæ from specimens I have found in my house in Suffolk.

147. Glypta tricarinata, *Cam.*

Glypta tricarinata, Cameron, Zeits. Hym.-Dip. 1908, p. 41 (♀).

♀. Black. *Head* with the mandibles, palpi, and the smooth clypeus, bright flavous; face irregularly and transversely aciculate, laterally irregularly punctate; frons somewhat strongly, vertex sparsely and feebly, punctate. *Pronotum* with an apical triangular bright flavous mark, its pleuræ closely punctate, except beneath;

apical half of the mesonotum closely and finely reticulate, the basal with distinct punctation; mesopleuræ closely punctate, except basally above; metanotum more finely punctate basally than centrally; lateral areæ large, with distinct costulæ separating the smaller and square basal, from the longer than broad apical, areæ; areola distinct, elongate, and narrower than the lateral areæ; petiolar area rugulosely punctate; metapleuræ distinctly carinate, more strongly and closely punctate than the mesopleuræ, becoming apically substrigose above. *Scutellum* strongly and closely punctate. *Abdomen* with the oblique impressions broad and deeply impressed, the four basal segments closely and somewhat strongly punctate, and the first three discally longitudinally carinate; basal segment laterally carinate in the centre on either side of the disc, and bearing a narrow basal testaceous line; apices of the two following segments similarly marked with testaceous, and a short apical testaceous line on either side of the fourth; terebra half the length of the body. *Legs* fulvous; anterior coxæ and trochanters stramineous; front femora subflavescent; hind legs with the coxæ red, trochanters bright flavous, femora blackish and internally paler, tibiæ testaceous and apically black, tarsi darker testaceous and apically blackish. *Wings* hyaline, with stigma and nervures black.

Length 19 millim.

SIKKIM (*Col. Bingham*).

Unknown to me.

Genus **APOPHUA**, gen. nov.

GENOTYPE, *A. carinata*, Morl.

Head distinctly transverse and strongly constricted behind the oval eyes; frons simple, vertex very narrow; clypeus strongly convex and small, apically rounded, pilose and indistinctly discrete from the subprominent epistoma; mandibles stout, with equal teeth. Antennæ slender and filiform, about the length of the body. Thorax not very stout; mesonotum deplanate, with very indistinct notauli; metathoracic areæ complete but indistinct; basal area small, areola elongate, with costulæ; petiolar area entire but with the basal carina weak; spiracles small and subcircular. Scutellum convex and triangular, sometimes pale. Abdomen sessile, dorsally deplanate and entirely dull, linear or sublanceolate, with the apical segments becoming gradually narrower; central segments apically pale; basal segment hardly curved, laterally margined, with elongate and conspicuous discal carinæ, and spiracles close to the base; apical ventral segment incised apically and not retracted; terebra a little shorter than the abdomen; valvulæ of ♂ incrassate and apically obtuse. Legs somewhat short and slender; hind calcaria of unequal, the intermediate of equal, length; front tibiæ with but a single calcar, which is basally sinuate, apically strongly attenuate and acuminate and extends nearly to the apex of the metatarsus; fifth tarsal

joint distinctly longer than the fourth, the claws sparsely and finely but distinctly pectinate. *Wings* somewhat narrow and of normal length, with no areolet; first recurrent nervure of hind wing intercepted below the centre.

Range. Assam, Ceylon, Sikkim, Shanghai.

This genus is closely allied to *Glypta* in its oblique abdominal incisions and general conformation, but the segments are basally broader, with their spiracles prominent, the sculpture is altogether coarser, and, above all, it is at once distinguished from any Ichneumonidous genus with which I am acquainted by the unique structure of the front calcaria, a modification suggesting an association in life with some unusually glutinous substance, necessitating extraordinary powers for cleansing the mouth parts. A similar structure has since become known to me in the following genus.

I have seen two, somewhat doubtfully distinct, Indian species of this genus; and, in the British Museum, is a third, collected at Shanghai by Mr. Fortune and presented in 1854.

Table of Species.

1 (2)	Scutellum flavous and nitidulous; frons shining	*carinata*, sp. n.
2 (1)	Scutellum black and rugose; frons closely punctate	*metopiiformis*, sp. n.

148. **Apophua metopiiformis**, sp. n.

♂. A dull black species, with the mouth, small callosities before radix, base of the first and apices of the three basal segments, and the legs, pale; the head coarsely sculptured throughout, the immaculate scutellum and metathorax rugose, and the hind femora, tarsi, and apices of their tibiæ infuscate.

Fig. 50.—*Apophua metopiiformis*, Morl.

Length 10 millim.

Sikkim, iv.–vi. 1900 (*Col. Bingham*).

Type in the British Museum.

This species is obviously congeneric with *A. carinata* and may possibly constitute its male, though it is altogether a little stouter and larger, the head is much more roughly sculptured, with the vertex dull and somewhat closely punctate, the scutellum is very rugosely punctate, more convex and immaculate, with the frenum alone pale; the anteradical callosities are much shorter, the areola of the more rugose metanotum is apically truncate; the basal segment with a strong central carina, and the anus is immaculate

black from the third segment. In short, the sculpture is more pronounced and the pale markings less profuse, which is rarely the case in the males of these parasites. In superficial facies, it somewhat resembles members of the genus *Metopius*, Panz.

149. **Apophua carinata**, sp. n.

♀. A dull black species, with scutellum and all the segmental apices flavous. *Head* black and strongly constricted behind the prominent and entire eyes; frons and vertex nitidulous, with a few isolated punctures; face irregularly transversely strigose-punctate; clypeus hardly broader than long, shining, flavous and subglabrous; mandibles flavous, margined below, with their teeth black and equal. *Antennæ* filiform, black, with the scape testaceous internally and beneath. *Thorax* black, with the pronotum centrally, and elongate callosities thence to the radices, flavous; mesonotum closely and coriaceously punctate, triangular, with the notauli obsolete; metathorax more finely punctate, with elongate griseous pilosity; basal areæ small and quadrate; areola twice as long as broad, parallel-sided, apically emarginate, emitting the costulæ from before its centre; petiolar area short, entire, and shining. *Scutellum* flavous throughout, sparsely punctate and strongly nitidulous; postscutellum and frenum immaculate. *Abdomen* dull, longitudinally and irregularly striolate, with apices of all the segments testaceous and their centre distinctly carinate to apex of the fourth; basal segment half as long again as broad, evenly punctate, basally flavous and bicarinate to the emarginate apex; terebra as long as abdomen. *Legs* testaceous, the hind ones missing, except their red coxæ. *Wings* hyaline, with the tegulæ and costæ black, radix flavous and stigma piceous.

Length 8½ millim.

ASSAM: Khasi Hills, 1000–3000 ft., iii. 07 (Pusa coll.); CEYLON: Maskeliya, iii. 09 (*T. Bainbrigge Fletcher*).

Type in the Pusa collection.

The above description is drawn from two females. The Ceylon specimen agrees exactly with the type, except in the possession of an entirely pale red metathorax and in having the first segment more broadly red basally.

Tribe *LISSONOTIDES*.

No hesitation can be experienced respecting the representatives of this tribe, for they are all very easily distinguished by negative characters. The head is transverse and not cubical, as in the XORIDIDES; the abdomen is evenly sculptured, usually finely punctate or coriaceous, throughout, and not at all impressed nor tuberculate as in the PIMPLIDES; the basal segment, though slender, is not subpetiolate as in the HEMIGASTRIDES, nor are its

spiracles beyond the centre; the hypopygium does not reach the anus nor cover the base of the terebra, although in *Lampronota* it has distinct indications of such a modification, and in my 'Ichneumons of Britain' I placed that genus in proximity to the Acænitides; and the areolet is triangular or oblique and small or wanting, never rhomboidal as in the Banchides.

Table of Genera.

1 (16)	Areolet distinct, though rarely apically incomplete; notauli superficial.	
2 (3)	Front tibiæ unicalcarate; clypeus not discrete	Stictolissonota, Cam.. [p. 216.
3 (2)	Front tibiæ bicalcarate; clypeus basally discrete.	
4 (11)	Metathoracic spiracles circular: areolet sessile or subpetiolate.	
5 (6)	Abdomen subpetiolate and glabrous; areolet transverse......	Phytodiætus, Grav., p. 218.
6 (5)	Abdomen subsessile and not glabrous; areolet not broader than high.	
7 (8)	Nervellus emitted far above centre; antennæ slender	Phytodiætoides, gen. nov., [p. 221.
8 (7)	Nervellus emitted at or below centre; antennæ normal.	
9 (10)	Body stout and pilose; nervelet distinct....................	Alloplasta, Först., p. 222.
10 (9)	Body slender and subglabrous; nervelet wanting............	Lissonota, Grav., p. 224.
11 (4)	Metathoracic spiracles elongate; areolet distinctly and often elongately petiolate.	
12 (13)	Tarsal claws pectinate; clypeus prominent	Ctenopimpla, Cam., p. 231.
13 (12)	Tarsal claws simple; clypeus not prominent.	
14 (15)	Radius not curved above the apically incomplete areolet ..	Meyva, Cam., p. 232.
15 (14)	Radius curved above the apically complete areolet	Syzeuctus, Först., p. 234.
16 (1)	Areolet entirely wanting; notauli deeply impressed	Lampronota, Hal., p. 240.

Genus **STICTOLISSONOTA**, *Cam.*

Stictolissonota, Cameron, Tijds. Ent. 1907, p. 106.

Genotype, *S. foveata*, Cam.

Clypeus not discrete from face and apically rounded, with a deep and distinct rounded impression, which is longer than broad, above its centre; cheek distinct and as long as the pedicle. Antennæ longer than the body, slender, with the basal flagellar joints elongate, and the seventh and eighth from apex dilated.

Metathorax large and apically rounded, closely and uniformly punctate, with no areæ; spiracles small and oval; metapleural carinæ distinct. Abdomen short and not much longer than the thorax; three basal segments strongly and closely punctate; the first sessile and broad, longer than the second and roundly dilated basally; anus truncate and laterally compressed, with no distinct hypopygium. Legs elongate, with the apices of the joints spinose; front tibiæ with but a single calcar, long, slender and more than half the length of the metatarsus; claws closely pectinate. Areolet sessile, emitting the recurrent nervure beyond its centre; the transverse median nervure received shortly beyond the transverse basal; hind wings with the first recurrent nervure intercepted near the bottom.

Range. Sikkim.

The single calcar, pectinate claws, the conformation of the clypeus, etc., indicate a relationship between this genus and my *Apophua,* from which the entire areolet and the abdominal conformation will easily distinguish it. Its author says (*l. c.*):— "The type of this genus looks more like a Cryptid than a Pimplid. It should be readily known by the strongly punctured basal abdominal segments, with the first roundly dilated at the base; the known species of Lissonotini have the abdomen smooth and shining, at the most shagreened. The absence of lateral impressed lines on abdominal segments 2–5 separates it from the Pimplini, with which it agrees in having the segments punctured; but it has a much more slender form, with much longer and more slender antennæ. The long, slender, white-banded antennæ add considerably to its resemblance to a Cryptid." Though this genus and the preceding appear to fall most naturally into different divisions of the Pimplinæ, their similar modifications of structure are very remarkable and show them to be not distantly allied forms.

150. Stictolissonota foveata, *Cam.*

Stictolissonota foveata, Cameron, Tijds. Ent. 1907, p. 107 (♀).

♀. A black species, with flavescent markings. *Head* closely and distinctly punctate; cheeks, mandibles (except apically), the sparsely punctate clypeus (except laterally), and "the sides of the face broadly, the mark obliquely narrowed to a point above the antennæ, the mark as wide as the black central part," flavous; palpi fulvous and basally paler. *Antennæ* covered with dense, obsolete pubescence; scape broadly at the apex, and the eighth to sixteenth flagellar joints, white. *Thorax* with two large hamate marks on the strongly punctate mesonotum, propleuræ broadly below, callosities beneath all the radices, and "a large mark, longer than wide, transverse above and at the sides, roundly dilated in the middle below," the position of which is not indicated by the author, flavous; metathorax closely punctate, its sides and

apex with dense silvery pubescence. *Scutellum* flavous. *Abdomen* with the two basal, and the basal two-thirds of the third, segments closely and strongly punctate; the apical ones shining and very smooth; the apices of the three basal segments broadly, of the fifth narrowly in the centre and the whole of the sixth, with base of the first broadly and the cerci, flavous; terebra one-fourth the length of the body (2 millim.). *Legs* red, the anterior paler and fulvescent with their coxæ and trochanters flavous; apices of the hind coxæ, femora and tibiæ, together with the base of the flavescent tarsi, black. *Wings* clear hyaline, with the nervures and stigma black, and tegulæ flavous; second recurrent nervure broadly fenestrated and emitted near the apex of the areolet.

Length 8 millim.

SIKKIM (*Bingham*).

Unknown to me.

Genus PHYTODIÆTUS, *Grav.* (emend.).

Phytodietus, Gravenhorst, Ichn. Eur. ii, 1829, p. 929.

GENOTYPE, *P. coryphæus*, Grav.

Body smooth and graceful, not strongly and elongately pilose. Antennæ as long as body, more or less slender, with the apical joints cylindrical and not discrete. Notauli often anteriorly distinct, metathoracic costæ entirely wanting, metapleuræ longitudinally subsulcate near the quite circular spiracles. Scutellum somewhat convex and usually pale-marked; frenum pale. Abdomen smooth, with a shining bloom and not punctate, often with the segments pale-margined; anus usually subcompressed; hypopygium retracted; basal segment convex and not carinate; spiracles of the second close to the lateral margin; terebra longer than half, but not the whole, abdomen. Tibiæ spinulose, with their calcaria elongate; tarsal claws very closely and distinctly pectinate. Areolet broad and obliquely triangular, emitting the recurrent nervure from hardly before its apex; nervellus intercepting below the centre, sometimes at the lower angle.

Range. Europe, Central America, Trinidad, Canada, Sikkim, Ceylon.

Gravenhorst placed this genus in the CRYPTINÆ, along with *Mesochorus* and *Plectiscus*, which are now regarded as OPHIONINÆ. But his genus has been considerably subdivided by subsequent authors and only three of the original twelve species and the anomalous *P. corvinus* are now retained therein. Their subfusiform abdomen and thorax, attenuated basal segment and slender legs certainly ally them with the CRYPTINÆ, while the occasionally subcompressed anus resembles that of the BANCHIDES; they are, in particular, very liable to be mistaken for the Tryphonine *Mesoleius*, from which it is difficult to instance any male distinction, though the females are rendered obvious by their exserted terebra.

The genus, as a whole, is in need of revision, owing to inaccuracies arising from lack of structural distinctions and the instability of coloration, upon which too much reliance has formerly been placed.

Table of Species.

1 (2) First abdominal segment not basally explanate	*coryphæus*, Grav.
2 (1) First abdominal segment distinctly explanate basally	*capuæ*, sp. n.

151. Phytodiætus coryphæus, *Grav.*

Phytodietus coryphæus, Gravenhorst, Ichn. Eur. ii, 1829, p. 945, excl. var. 3; Taschenberg, Zeits. Ges. Nat. 1863, p. 292 (♀); Schmiedeknecht, Zool. Jahr. 1900, p. 340; Morley, Ichn. Brit. iii, 1908, p. 243 (♂ ♀).

♂ ♀. *Head* not very narrow behind the eyes; epistoma a little prominent; ♀ with palpi and mandibles (except apically) testaceous, clypeus ferruginous and the orbits flavous on the vertex; ♂ with the whole face, mouth, cheeks and frontal orbits to occiput flavous. *Antennæ* slender and a little longer than the body; black, often dull ferruginous beneath, but never clear red or testaceous. *Thorax* black; of ♀ often with only a small callosity before the radix, but more usually with subhamate lines before and callosities beneath radix and a centrally interrupted metathoracic fascia, more or less flavous; ♂ with part or whole of pro- and meso-sternum, and a small mark on mesopleuræ, also flavous. *Scutellum* with a basal dot on either side, its apex, a dot or line on the postscutellum, and often the freni narrowly, flavous. *Abdomen* shining, with all, or only the apical segments, or none of them, with narrow and obsolete glaucous margins; basal segment of ♂ not more than half as long again as, of ♀ very little longer than, apically broad, in both sexes explanate towards the apex, not parallel-sided nor basally explanate; ♂ with second and third segments quadrate and the fourth, like the second and following of ♀, transverse; ♂ valvulæ exserted; abdomen 4 millim., terebra $2\frac{1}{2}$ millim. *Legs* red; coxæ black with the hind pair of ♀ usually mainly red, ♂ sometimes with the anterior

Fig. 51.—*Phytodiætus coryphæus*, Grav.

entirely and the hind ones beneath flavous; trochanters red or flavous, with the hind ones, and sometimes also the anterior, partly black; hind tarsi and apices of tibiæ infuscate. *Wings* iridescent and subhyaline; stigma and radius testaceo-stramineous, radix and tegulæ whitish; areolet irregularly triangular or oblique, petiolate or subpetiolate; nervellus not intercepted above the lower fourth, often almost at the lower angle, but a little higher in ♂.

Length 6–7 millim.

SIKKIM: Darjiling, 6000 ft., x. 05 (*E. Brunetti*).

Type in the Breslau Museum.

This common European species, which is known to prey upon Noctuids, Geometrids, and *Platypteryx*, evidently has an unexpected eastern distribution. Brunetti's broken specimen is in the Calcutta Museum.

152. **Phytodiætus capuæ**, sp. n.

♂ ♀. A black, brightly flavous-marked species. *Head* narrowed behind the eyes and the mouth, cheeks, face and frontal orbits to vertex, flavous; mandibles apically and a fascia before the clypeus black. *Antennæ* very slender and distinctly longer than the body; scape black, and in ♂ flavous beneath; flagellum entirely black. *Thorax* black, with the pronotum, propleuræ basally, hamate marks before the radix, two large callosities beneath it, a circular mark on disc of mesonotum, the lateral sutures and most of apical half of metathorax, with spots above the posterior coxæ, flavous; ♂ with mesopleuræ entirely flavous below. *Scutellum*, postscutellum and both freni bright flavous, with no central black mark. *Abdomen* a little longer than head and thorax, and in ♂ slightly narrower than the latter; all the segments with bright glaucous-flavous margins; basal segment hardly half as long again as broad at its apex, subparallel-sided and distinctly explanate on either side at its base, ♂ spiracles strongly prominent; second segment longer than broad and the following transverse, all nitidulous and obsoletely shagreened, with short close recumbent golden pubescence; ♂ valvulæ exserted; abdomen 3 millim., terebra 2 millim. *Legs* pale fulvous and distinctly elongate, with the coxæ and trochanters stramineous and only the hind coxæ broadly black-marked beneath; hind tarsi and most of their tibiæ blackish, the latter basally ferruginous. *Wings* iridescent and not clouded; stigma and radius testaceous, radix and tegulæ stramineous; areolet acutely triangular and subpetiolate, emitting the recurrent nervure only just before its apex; nervellus intercepted at its lower third.

Length 6–8 millim.

CEYLON: Pundaluoya (*E. E. Green*).

Type in the author's collection.

This species is probably most closely allied to *P. polyzonias*, Först., from which, besides its very distinctive coloration, it differs

materially in the shorter basal segment whose spiracles are more prominent in both sexes though especially so in the ♂.

It is a very interesting and beneficial species, since the types of both sexes, which Mr. E. Ernest Green has bred together at Pundaluoya in Ceylon, emerged from larvæ which had been preying ectoparasitically upon those of the coffee pest, the Tortricid *Capua coffearia*; another female was also bred by him at the same locality from the same host in March, 1903. I am not aware that members of this genus have before been noticed to be external parasites, though they have frequently been raised from both Tortricid and other moths in Europe.

Genus **PHYTODIÆTOIDES**, gen. nov.

GENOTYPE, *P. megæra*, sp. n.

Body graceful and nearly smooth, neither strongly punctate nor elongately pilose. Antennæ as long as body, very slender and filiform throughout, with the apical joints cylindrical and not discrete. Notauli obsolete; metathoracic costæ entirely wanting; spiracles circular and very small. Scutellum hardly convex and always pale, with the frenum partly pale. Abdomen finely coriaceous, neither punctate nor impressed, the segments with pale margins and the anus subcompressed; hypopygium retracted; basal segment convex and not carinate; terebra longer than half, but not than the whole abdomen. Tibial calcaria elongate; tarsal claws not pectinate. Areolet broad and obliquely triangular, emitting the recurrent nervure from its apical third; first recurrent of lower wing strongly postfurcal, emitting the nervellus from far above its centre, from about its upper fourth part. Abdomen distinctly sessile; areolet sessile; inner cubital nervure but slightly curved, with no nervelet; eyes internally emarginate; clypeus convex and basally emarginate.

Range. Assam.

In its superficial facies this genus bears a very strong resemblance to *Phytodiætus*, Grav.; but differs materially in its simple tarsal claws and metapleuræ, not entirely glabrous abdomen, and in the disposition of the alar nervures. It appears to be somewhat related to *Nadia*, Tosq. (Mem. Soc. Ent. Belg. 1896, p. 337) though the sculpture of the basal abdominal segmentwill instantly distinguish it therefrom. I have seen but a single species.

153. **Phytodiætoides megæra**, sp. n.

Chrysopimpla flavipalpis, Cam. MS.

♀. A black species, with sparse flavous markings and most of the legs red. *Head* immaculate, the face with long grey pilosity and the palpi alone bright flavous. *Antennæ* very slender, black,

with the scape conspicuously flavous beneath. *Thorax* discally deplanate, finely punctate and black, with a line on upper part of propleuræ, callosities below radices, and elongate dots on the mutic apophyses, bright flavous; meso- and metapleuræ finely and closely pilose and punctate; metanotum shining, deplanate throughout and coriaceously trans-aciculate. *Scutellum* and postscutellum flavous and slightly convex. *Abdomen* parallel-sided and deplanate, with the apices of all the segments narrowly, and their apical angles somewhat broadly, flavous; basal segment but slightly narrowed and only a little longer than broad, with the basal impression glabrous and the remainder, like the second, coriaceous; following segments finely and closely alutaceous; terebra half the length of the abdomen. *Legs* not stout, red, with the anterior coxæ and trochanters, a discal spot on the black hind ones, and an indeterminate band before the base of the black hind tibiæ, stramineous; hind tarsi and calcaria black, the former with the penultimate joint only one-fourth of the apical. *Wings* ample and hyaline; tegulæ flavous and stigma piceous, with base paler.

Fig. 52.
Phytodiætoides megæra, Morl.

Length 10 millim.

ASSAM: Khasi Hills, 6000 ft., v. 03 (*Rowland Turner*).

Type in the British Museum.

This species has somewhat the facies of *Lissopimpla albopicta*, Walk.

Genus ALLOPLASTA, *Först.*

Alloplasta, Förster, Verh. pr. Rheinl. 1868, p. 167.
Trichopimpla, Cameron, Zeits. Hym.-Dip. 1903, p. 303.

GENOTYPE, *Lissonota murina*, Grav.

Head and thorax densely pilose; temples not broad, occiput margined, cheeks normal and the apically bidentate mandibles broad; clypeus apically rounded and discally convex. Antennæ neither slender nor elongate, with no pale central band; flagellar joints short, the first not nearly twice the length of the second. Metathorax evenly punctate throughout; always with but one, usually centrally obsolete, transverse costa; spiracles circular, prominent and not large. Abdomen with basal segment not densely pilose; the following impunctate, not smooth, finely trans-reticulate throughout, with no impressions; hypopygium not extending to anus, cultriform and basally broad; terebra exserted, shorter than abdomen; central segments not longer than broad. Legs of normal length, front tibiæ basally gradually constricted;

claws somewhat large, not pectinate, of ♂ obsoletely and of ♀ distinctly ciliate beneath. Areolet subrhomboidal, sessile or shortly petiolate; upper basal emitted from median nervure very distinctly before the lower basal; internal cubital sharply angled centrally, with the nervelet often distinct; first recurrent nervure of lower wings intercepted at or a little below the centre.

Range. Europe, Simla.

In my 'Ichneumons of Britain' (iii, 1908, p. 226) I suggested that *Meniscus murinus*, Grav., and *M. plantarius*, Grav., were probably of a distinct genus from the remainder of the species there tabulated, on account of their finely setiferous and not pectinate claws and of their very distinct economy; but I refrained from employing Förster's inadequate and typeless genus, until further elucidated. This had, however, been already done by Cameron, without either his knowledge or mine (I had not looked up Indian references for British insects and he had little knowledge of Förster's genera, nor apparently of the abundant European *Meniscus murinus*); consequently, I think, one is justified in now employing *Alloplasta* in nomenclature, with type *Lissonota murina*, Grav., Ichn. Eur. iii, p. 99 (= *Trichopimpla*, Cam.; type, *T. pilosa*). Ashmead's characters for this genus are entirely valueless. It differs little from the rare *Arenetra*, Holmg., in the pilosity of the head and thorax, but distinctly in that of its typically nitidulous basal abdominal segment, and in its evenly punctate metathorax, which in *Arenetra* is distinctly rugose throughout and not punctate; from *Meniscus* it is distinguished by the structure of the claws.

154. Alloplasta pilosa, *Cam.*

Trichopimpla pilosa, Cameron,* Zeits. Hym.-Dip. 1903, p. 303 (♀).

♀. An entirely black species, with elongate pilosity, and the legs alone rufescent. *Head* stout, with the frons closely punctate and in the centre transversely and indistinctly strigose; vertex closely punctate, more sparsely laterally; face closely and rugosely punctate, with the clypeus less closely and strongly and more nitidulous; centre of inner orbits narrowly, and the apical third of clypeus, rufescent; mandibles and palpi black, with the apical teeth ferruginous. *Thorax* closely and uniformly punctate on the disc, and a little more strongly on the metathorax; metanotum more coarsely punctate apically, and with distinct though short traces of a transverse costa at its apical angles; pleuræ

Fig. 53.—*Alloplasta pilosa*, Cam.

and sternum closely and distinctly punctate. *Scutellum* and *abdomen* immaculate; basal segment closely and distinctly punctate, with long but not dense pilosity, becoming stronger basally; central segments finely transversely aciculate, anus glabrous and nitidulous; terebra stout and black, with the spicula red, a little longer than half the abdomen. *Legs* red, with the coxæ, trochanters, the hind tarsi and apices of their femora, and the base and apex of their tibiæ, black; coxæ and trochanters with elongate white pubescence; hind calcaria unequal. *Wings* clear hyaline, with the nervures and stigma black; radix and tegulæ infuscate, with the latter basally fulvous.

Length 9 millim.

PUNJAB: Simla, iv. 97 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species very strongly resembles *A. plantarius*, Grav., but is a little smaller, with the metathoracic costa more distinct and the petiole not canaliculate, the front marks of the mesonotum and the pale markings both of the tibiæ and hind tarsi are wanting, and the abdomen is immaculate, though easily subfusiform.

Genus **LISSONOTA**, *Grav.*

Lissonota, Gravenhorst, Ichn. Eur. iii, 1829, p. 30.

GENOTYPE, *L. sulphurifera*, Grav.

Head transverse and neither buccate nor elongately pilose; clypeus discrete, somewhat convex and apically rounded. Antennæ filiform or apically subattenuate, with the flagellum normal; apical joints not moniliform or discrete. Thorax subcylindrical, longer than high; mesonotum often striped; metathorax punctate or scabriculous, with areola incomplete or often entirely wanting; basal costa of petiolar area usually distinct and strong; spiracles small and circular. Scutellum normal, often pale-marked. Abdomen narrow and deplanate, somewhat smooth, not tuberculate or obliquely incised, usually closely and finely punctate or alutaceous; segments not apically elevated, the basal elongate, sessile, rarely subquadrate; hypopygium always covering base of terebra and sometimes nearly reaching the anus; terebra slender and usually as long as, or longer than, the abdomen. Legs somewhat slender, with the tarsal claws not pectinate, though sometimes setiferous. Wings with a more or less distinct, and often subpetiolate, triangular areolet.

Range. Both hemispheres.

Unfortunately, I am compelled to leave this genus in a somewhat unsatisfactory condition; such species described by Cameron as I have not seen must remain here, since he makes no mention of their metathoracic spiracles; but in every case in which I have had the opportunity of examining the types I have found his insects to belong to the genus *Syzeuctus*. The representatives of the

present genus are entirely homogeneous and at once known from those of allied genera by their elongate and narrow abdomen, simple tarsal claws, circular metathoracic spiracles, evenly sculptured and excarinate metanotum, elongate terebra and the comparatively constant shape of the normally entire areolet. Unlike the Palæarctic representatives, all our Indian species are brightly marked and banded with flavous, and so much attention is paid to these decorations in descriptions that few structural details upon which to found a table of the species have been cited. The following may, perhaps, serve, though it should be worked with the table of *Syzeuctus*, as intimated above.

Table of Species.

1	(2) Metapleuræ with no carinæ; areolet irregular	*brevicauda*, sp. n., p. 225.
2	(1) Metapleuræ carinate; areolet regularly triangular.	
3	(6) Metanotum strongly and distinctly trans-strigose.	
4	(5) Pale vertical orbits not extending to ocelli	*spilopus*, Cam., p. 227.
5	(4) Pale vertical orbits extending to ocelli	*lepida*, Cam., p. 227.
6	(3) Metanotum strongly punctate and not strigose.	
7	(10) Areolet petiolate; abdomen not aciculate.	
8	(9) Antennæ immaculate; terebra longer than half the body	*minuenta*, sp. n., p. 228.
9	(8) Antennæ pale-banded; terebra shorter than half the body	*binghami*, Cam., p. 229.
10	(7) Areolet subsessile; abdomen partly aciculate.	
11	(12) Scutellum flavous; second and third segments aciculate	v-*maculata*, Cam., p. 229.
12	(11) Scutellum black; basal segment at most aciculate.	
13	(14) Central segments bicoloured; terebra longer than body	*morum*, sp. n., p. 230.
14	(13) Central segments tricoloured; terebra longer than half the body	*greeni*, Cam., p. 230.

155. **Lissonota brevicauda**, sp. n.

♀. A small black species, with the body marked and the antennæ banded with white, legs mainly fulvous and wings hyaline. *Head* subvertical behind the eyes, dull, closely and evenly punctate; black, with the facial orbits very broadly to apices of elongate cheeks, the indistinctly discrete glabrous and convex clypeus, and the mandibles (except their bidentate apices), stramineous; face deplanate and more sparsely punctate laterally, frons flat, with the scrobes small and entirely punctate. *Antennæ* fully as long as body, very slender and strongly attenuate apically,

with all the joints cylindrical, the basal flagellar joint elongate and the six central, like the scape beneath, stramineous. *Thorax* not very slender, entirely dull, closely and finely punctate throughout; black, with prothorax basally throughout, hamate marks on either side of front of mesonotum, callosities before and beneath radices, and a mesopleural mark before the intermediate coxæ, stramineous; notauli wanting; metathorax white-pilose, with no trace of costæ, the lateral carinæ extremely obsolete, the spiracles small and circular. *Scutellum* stramineous, sparsely punctate but dull; postscutellum black. *Abdomen* hardly longer than thorax, distinctly punctate, more obsoletely and shining towards the compressed anus; basal segment hardly twice as long as apically broad, constricted before its dilated and broadly stramineous base: apical margins of the three basal, of the sixth and following segments, broadly flavous; terebra somewhat stout, straight and not longer than the two basal segments. *Legs* fulvous, with the front or anterior coxæ and trochanters stramineous; hind legs elongate, with apices of coxæ, femora, tibiæ and tarsi, together with base of the last, black; hind tarsi mainly, and base of their tibiæ, whitish; all the tarsal claws sparsely and obsoletely pectinate. *Wings* entirely hyaline, radix and tegulæ stramineous, costa and stigma piceous; areolet subsessile, irregular, emitting the inner cubital from near its centre and the recurrent from its apical third; radial nervure straight; nervellus subpellucid, emitted far below centre of the straight and slightly postfurcal first recurrent of lower wings.

Fig. 54.—*Lissonota brevicauda*, Morl.

Length 8 millim.

Sikkim, iv.–vi. 1900 (*Col. Bingham*); Nicobar Islands, iii. 04 (*G. Rogers*).

Type in the British Museum.

This species probably merits generic rank in the modern too elaborate classification, since it differs from *Lissonota* (*sensu stricto*) in its lack of metapleural carinæ, though sufficiently closely related in its sparsely pectinate claws and circular metathoracic spiracles, which will distinguish this brightly marked species from the similarly decorated ones of *Syzeuctus*.

Described from two females in the British Museum.

156. **Lissonota spilopus**, *Cam.*

Lissonota spilopus, Cameron, Zeits. Hym.-Dipt. 1908, p. 42 (♂).

♂. Black. *Head* with the clypeus, mandibles (except at apices), inner orbits broadly, and the centrally black and somewhat strongly punctate face, pale flavous; vertex, and the centrally sulcate frons, smooth and nitidulous. *Antennæ* piceous, with the scape beneath, and a broad flagellar band near their apices, white. *Thorax* black, with the following pale flavous markings:—a line on the irregularly strigose propleuræ below, callosities beneath all the radices, large hamate marks on either side of the closely and strongly punctate mesonotum in front, others on the lower part of the irregularly punctate mesopleuræ which have the apical half triangularly dilated, and others on the closely and much more strongly punctate metapleuræ which are broadly rounded basally above and apically narrower; metanotum closely and strongly transaciculate, becoming more or less reticulate apically. *Scutellum* less strongly and closely punctate than the mesonotum and, except apically, pale flavous. *Abdomen* with the four basal segments narrowly pale flavous at the apex, and more or less broadly so basally; basal segment slightly longer than the two following together, slender, cylindrical and parallel-sided throughout. *Legs* pale fulvescent-flavous: anterior tarsi subinfuscate; hind legs with the femora and the strongly punctate coxæ pale red, the latter basally flavous above and apically black, the former narrowly black at base and apex; their tibiæ and tarsi pale flavous with the apex of the former from near the centre, nearly the basal half of the metatarsi and the apical half of the onychii, black. *Wings* hyaline, with the nervures and stigma black; areolet triangular and shortly petiolate; recurrent nervure continuous with the second submarginal.

Length 9 millim.

SIKKIM (*Col. Bingham*).

Unknown to me.

157. **Lissonota lepida**, *Cam.*

Lissonota lepida, Cameron, Zeits. Hym.-Dip. 1908, p. 43 (♂).

♂. Black. *Head* smooth; inner orbits broadly flavous to centre of ocelli, the face flavous and distinctly but not closely punctate in the centre; clypeus with a few scattered punctures. *Antennæ* flavescent, infuscate above, with a broad white band beyond their centre. *Thorax* black; propleuræ flavous and strigose below; the following markings also flavous:—a large hamate mark on either side of the closely and somewhat strongly punctate mesonotum in front, the callosities, a large mark with "the top straight to the end above, obliquely sloped below, the base rounded: below it becomes gradually obliquely widened to near the apical fourth, which is straight below" on the lower half of the less strongly punctate and centrally glabrous mesopleuræ; metanotum

closely and strongly trans-reticulate, much more strongly so at its apex; a large central mark on the sparsely punctate metapleuræ with "its base straight, rounded above, the apex narrower, rounded, the middle below incised, the base of the incision obliquely sloped, longer than the apex, which has a straight up and down slope," flavous. *Scutellum* flavous, closely and somewhat strongly punctate. *Abdomen* black, with the basal half of the first two segments, the third with the exception of a central nigrescent fascia, and the apices of all the following broadly, flavous; apical half of the first segment distinctly stouter than the basal, with a triangular basal incision in its black coloration. *Legs* fulvescent flavous, with only the apical half of the hind coxæ black above. *Wings* with the areolet triangular and sessile; its recurrent nervure broadly fenestrate below.

Length 8 millim.

SIKKIM (*Col. Bingham*).

This species "may be known from *L. spilopus* by the broader band on the inner orbits, it touching the ocelli, which is not the case with *L. spilopus*; by the base of the mark on the mesopleuræ being gradually narrowed from the middle, it being in *L. spilopus* abruptly dilated before the middle and by the incision on the mark on the metapleuræ being narrower, deeper and oblique" (Cameron, *l. c.*); the areolet is sessile in the present species. Unknown to me.

158. **Lissonota minuenta, sp. n.**

♀. A black and somewhat profusely flavous-marked species, with the legs fulvous and abdomen tricoloured; terebra longer than half the body.

Length 7 millim.

SIKKIM: Darjiling, 6000 ft., ix. 08 (*E. Brunetti*).

Type in the Indian Museum.

Extremely similar to *L. binghami*, with which I should have merged it were not the immaculate antennæ and comparative terebral length sufficiently constant characters; the present female may be known by the immaculate black antennæ; black metathorax, with only the apices of the pleuræ flavous; mesosternum immaculate black and the mesopleuræ flavous only below; abdomen with base and apex of the first three segments red, the extreme apex of the third and of all the following flavous; terebra exactly as long as the abdomen (4 millim.) and longer than half the body; legs fulvous, with their base flavous, and the hind tibiæ alone subinfuscate apically; hind coxæ fulvous, with their disc flavous; areolet distinctly petiolate, emitting the recurrent nervure from its apex. It is allied in coloration to *L. lineata*, Grav., but the radial nervure is not sinuate above the petiolate areolet and the terebra is proportionately much shorter.

159. **Lissonota binghami,** *Cam.*

Lissonota binghami, Cameron, Tijds. Ent. 1907, p. 109 (♀).

Black, with profuse flavescent markings. *Head* with the face closely punctate centrally, and sparsely at the sides; frons and vertex subglabrous; sides of face broadly, clypeus except its basal margin, the frontal, vertical and lower external orbits, flavous; mandibles, except below and apically, white. *Scape* and base of flagellum beneath, and a broad central band on the latter, white. *Thorax* closely and strongly punctate; the following markings flavous :—hamate marks on apex and a subquadrate one on basal half of mesonotum, two oblique and externally dilated spots at base of the basal half of metanotum, a line on lower side of propleuræ, the radical callosities, a large central mark on apex of mesopleuræ, a small one behind the hind wings, mesosternum broadly and most of metapleuræ; metanotum more strongly punctate than the mesonotum, with its pale pubescence denser than elsewhere. *Scutellum* flavous and not very strongly punctate. *Abdomen* with the apices of all the segments, and the base of the first three, flavous; terebra hardly half the length of the body (5 millim.). *Legs*: anterior pairs pale flavous, their femora with a fulvescent tinge; hind legs fulvous, their coxæ flavous, with the apical half black above, their trochanters apically, femora and tibiæ narrowly, and the onychii, black. *Wings* hyaline, with the stigma and nervures black; areolet triangular and subpetiolate, emitting the recurrent nervure from its apex.

Length 12 millim.

SIKKIM (*Col. Bingham*).

Unknown to me.

160. **Lissonota v-maculata,** *Cam.*

Lissonota v-*maculata,* Cameron, Tijds. Ent. 1907, p. 108 (♀).

A black species, with profuse flavescent markings. *Head* smooth, with the epistoma closely punctate; the frontal, facial broadly and outer orbits broadly below, mandibles except apically, and the palpi, flavous. *Prothorax* basally flavous and with the following flavous markings :—a spot at its apex, hamate marks on apex and an irregular mark at base of the closely and strongly punctate mesonotum, two curved oblique marks on base of metanotum, radical callosities, a large apical spot on the mesopleuræ and "a large mark, twice longer than broad with a large incision on the base above, a large mark, dilated below at the base and apex, the apical projection wider and longer than the basal," the position of these not being indicated; metanotum closely and rugosely punctate, with its disc subreticulate; pleuræ closely punctate, the meta- more closely and strongly than the mesopleuræ, propleuræ apically and basally strongly striate, except above at the apex. *Scutellum* somewhat sparsely punctate and,

except at its apex, flavous. *Abdomen* smooth, with the second and third segments aciculate; apices of all the segments, basal half of the first and base of the second, flavous; terebra hardly a third the length of the body (4 millim.). *Legs* flavous, with a fulvescent tinge; hind femora fulvous, their coxæ with a large apical mark, the apex of the hind tibiæ narrowly, and of their femora, black. *Wings* hyaline, with the stigma and nervures black; tegulæ flavous; areolet triangular and shortly petiolate; "the recurrent nervure interstitial with the second transverse cubital; the transverse median nervure received shortly beyond the transverse basal."

Length 13 millim.

SIKKIM (*Col. Bingham*).

Unknown to me.

161. **Lissonota morum**, sp. n.

♀. A somewhat stout, black and dark red species, with prominent eyes and pale anus. *Head* posteriorly narrow; eyes distinctly broader than the thorax; black, with the convex clypeus and the mandibles, except at their apices, stramineous; epistoma centrally protuberant. *Antennæ* as long as the body, black and filiform throughout, with the flagellum immaculate and the very deeply incised scape stramineous beneath. *Thorax* closely punctate, dull and immaculate black, with the notauli wanting; metathorax with no areæ, lateral carinæ alone present and spiracles circular; petiolar area subobsolete. *Scutellum* immaculate black and punctate. *Abdomen* linear, slightly longer than head and thorax, dull and very closely punctate, with the subglabrous apices of the three basal segments, as well as the base of the second and third indeterminately, rufescent; basal segment shagreened, anus flavous, and the reflexed terebra longer than the body (13 millim.). *Legs* red, with the hind coxæ, except apically, black; hind femora, tibiæ and tarsi infuscate. *Wings* normal and not broad, with the areolet distinctly and broadly sessile; nervellus intercepted, but not geniculate, at its lower third.

Length 10 millim.

ASSAM: Ukhrul, in Manipur, 6400 ft. (*Rev. W. Pettigrew*).

Type in the Indian Museum.

This female has much the facies of *L. parallela*, Grav., but the radial nervure is externally straight and not sinuate above the broader areolet.

162. **Lissonota greeni**, *Cam.*

Lissonota greeni, Cameron, Spolia Zeylanica, 1905, p. 142 (♀).

♀. A black, closely and regularly punctate species, with tricoloured abdomen and sparse flavous markings. *Head* with

clypeus broadly apically and more broadly centrally, mandibles except apically, and the palpi, flavous. *Antennæ*: scape flavous beneath. *Thorax*: propleuræ flavous below. *Abdomen* with the closely, distinctly and longitudinally aciculate first segment (which is glabrous at centre and apex) entirely, basal third of the closely and regularly punctate second, and the bases of the similarly sculptured third and apically smooth fourth segments narrowly, red; apices of the second and third flavous with a rufescent tinge; apical segments smooth and nitidulous, with the last and apex of penultimate white; terebra longer than half the body (5 millim.). *Legs* red, with the anterior coxæ (except intermediate apically), and their trochanters, flavous: hind tibiæ and tarsi black. *Wings* hyaline with the stigma and nervures nigrescent; areolet not petiolate.

Length 8 millim.

CEYLON: Peradeniya (*E. E. Green*).

The aciculate basal segment is remarkable. Unknown to me.

Genus CTENOPIMPLA, *Cam.*

Ctenopimpla, Cameron, Manch. Mem. 1899, p. 189.

GENOTYPE, *C. albomaculata*, Cam.

Head anteriorly transverse; eyes large, internally parallel, margined below and not emarginate; cheeks distinct; clypeus roundly projecting, deeply separated basally and apically rounded; mandibles equally bidentate apically. Antennæ not shorter than body. Notauli obsolete; metanotum transversely carinate before its apex, with the spiracles at apex of basal third, small and oval. Abdominal segments shagreened and longer than broad; petiolar spiracles small and subcircular, near apex of basal third; terebra elongate and not emitted from a ventral fold. Legs distinctly slender, with the tarsal claws pectinate; hind tarsi spinose, front ones double the length of their tibiæ. Areolet small, obliquely triangular, externally incomplete, with its petiole as long as its height, and emitting the recurrent nervure near its apex.

Range. Assam.

Its author compares this genus with *Lissonota*, though its pectinate claws relate it more closely to *Meniscus*; therefrom he says it differs, apart from the structure of the claws, in the petiolate areolet, more slender and elongate legs, and in the three basal segments being comparatively longer, which are not very tangible characters.

163. Ctenopimpla albomaculata, *Cam.*

Ctenopimpla albomaculata, Cameron, Manch. Mem. 1899, p. 190 (♀).

♀. *Head* black, with face and clypeus (except the epistoma longitudinally and the clypeal foveæ), the upper orbits narrowly, and

the outer more broadly below, flavous; front, vertex and face closely punctate and sparsely pilose; clypeus convex, smooth and impunctate; mandibles flavous, except at apex. *Antennæ* filiform and black, becoming piceous towards their apices. *Pronotum* more broadly flavous basally and the propleuræ broadly flavous below.

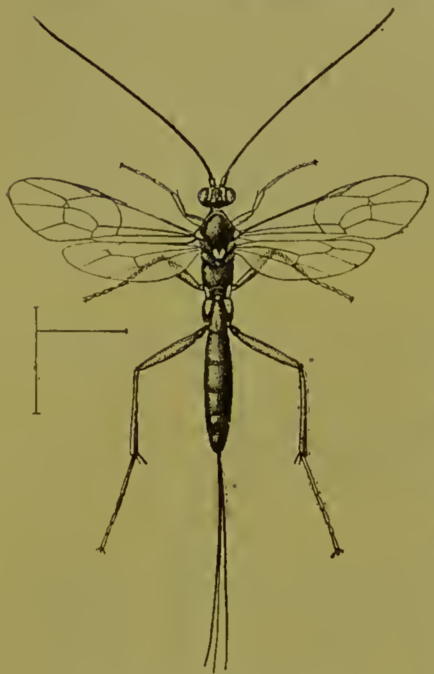

Fig. 55.—*Ctenopimpla albomaculata*, Cam.

Mesonotum dull and closely punctate: meso- and meta-pleuræ with broad flavous markings; metanotum closely and uniformly punctate, with the apex more strongly punctate beyond the carinæ. *Scutellum* somewhat strongly punctate, black, with two large basal flavous pyriform marks, which approximate discally. *Abdomen* with all segments black and twice as long as broad; first longer than second segment; the three basal closely punctate and the apical ones entirely glabrous; venter bright flavous, with apex darker; terebra very nearly as long as body. *Legs* red; anterior coxæ and trochanters flavous, the intermediate fulvidous; all the trochanters with black markings; hind coxæ black and basally flavous above, their tibiæ and tarsi black. *Wings* fulvous hyaline, darker basally; costa and nervures infuscate; areolet with petiole longer than inner submarginal nervure, the outer pellucid below.

Length 10 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Genus MEYVA, *Cam.*

Meyva, Cameron, Manch. Mem. 1899, p. 191.

Genotype, *M. villosa*, Cam.

Head oblique and not prominent behind the large and internally parallel eyes; cheeks short but distinct; clypeus not basally discrete; mandibles stoutly and unequally bidentate apically. Notauli wanting; metanotum strongly transversely unicarinate before its apex, with the spiracles elliptic and about thrice as long as broad. Abdominal segments longer than broad; basal segment as broad basally as apically, its spiracles small, circular, at

apex of basal third. Legs slender, with tarsal claws simple; hind tarsi not or hardly longer than the tibiæ; all tarsi spinose. Areolet externally incomplete, with its petiole as long as its height, and emitting the recurrent nervure from its apex.

Range. Assam.

This genus differs from *Ctenopimpla* in the elliptic metathoracic spiracles, simple tarsal claws and lack of basal clypeal sulcus; the basal abdominal structure resembles that of *Lissonota*.

164. **Meyva villosa**, *Cam.*

Meyva villosa, Cameron,* Manch. Mem. 1899, p. 192, pl. iii, fig. 11 (wing).

♂. *Head* black, with the inner orbits more narrowly centrally, the outer narrowly, a transverse line on lower part of the closely punctate and white-pilose face, the clypeus, mandibles broadly at their base, and palpi, flavescent; frons smooth and vertex very coarsely striolate. *Antennæ* immaculate. *Thorax* with dense short pale pilosity; pro- and meso-pleuræ closely punctate, with the latter centrally glabrous and nitidulous basally; mesonotum nitidulous and strongly punctate; metanotum strongly, deeply and, like the metapleuræ, closely punctate. *Scutellum* strongly but not closely punctate, with a flavous dot at base of its basal carinæ. *Abdomen* rufescent, with the basal segment except at apex and an interrupted mark near base of the second, black. *Legs* red; coxæ and trochanters black, with the front ones anteriorly flavescent; posterior tarsi black. *Wings* infuscate hyaline, apically infumate; stigma and nervures black; areolet emitting recurrent nervure from its apically pellucid outer nervure.

Fig. 56.—*Meyva villosa*, Cam.

Length 15 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Genus SYZEUCTUS, *Först.*

Syzeuctus, Förster, Verh. pr. Rheinl. 1868, p. 167.

Genotype, *Ichneumon maculatorius*, F.

Metathorax with elongate, and nearly always large, spiracles; metapleuræ not separated from the metanotum by a carina. Areolet entire and petiolate; nervellus intercepting the first recurrent of hind wings below its centre; face more or less intumescent; notauli entirely wanting; scutellum laterally margined only at base; basal abdominal segment glabrous, with spiracles before its centre; tarsal claws obsoletely dentate and setiferous. Thorax and abdomen rarely with red, but usually with very profuse flavous, markings; scutellum and postscutellum usually entirely flavous. Frons rarely bituberculate.

Range. Europe, Asia.

Species of *Lissonota* were not relegated to this genus till it was used by Thomson in 1889, when some of the prettiest of the European representatives were included therein, on account of their elongate metathoracic spiracles, which are also usually much larger than the circular ones of *Lissonota*, though in the Indian species they are often so minute that the microscope is necessary to distinguish their conformation. I have remarked under *Lissonota* that it appears to me extremely probable that some, if not the majority, of the species placed therein by Cameron belong, in reality, to the present genus.

Table of Species.

1 (4)	Wings hyaline throughout.	
2 (3)	Abdomen strongly compressed; antennæ pale-banded	*compressus*, sp. n., p. 234.
3 (2)	Abdomen not compressed, nor antennæ pale-banded	*claripennis*, Cam., p. 235.
4 (1)	Wings distinctly infumate apically.	
5 (6)	Metathoracic spiracles minute and reniform	*annulipes*, Cam., p. 236.
6 (5)	Metathoracic spiracles normal and elongate-ovate.	
7 (8)	Flagellum compresso-dilated beyond its centre	*xanthorius*, Cam., p. 238.
8 (7)	Flagellum normal; colour variable .	*baluchistanensis*, Cam., p. 239.

165. Syzeuctus compressus, sp. n.

♀. A profusely flavous-marked black species, with the wings entirely hyaline and the abdomen strongly compressed. *Head* vertical behind the internally parallel eyes, flavous, with the occiput, ocelli, the centrally sulcate frons more narrowly above, and centre of face, alone black; clypeus semicircular, convex and apically rounded. *Antennæ* slender, filiform and a little attenuate at their apices; black, with a broad 11-jointed band beyond their centre and the scape beneath, white. *Thorax* evenly punctate,

black, with the mesopleuræ sinuately sulcate and subglabrous centrally; the prosternum, mesosternum basally below, a broad hamate mark on either side of front of mesonotum and parallel with its disc, callosities before and beneath radices, and a large irregular mark on metapleuræ, stramineous; metanotum with no costæ but laterally longitudinally sulcate above the pale mark and below the elongate and somewhat large spiracles. *Abdomen* nitidulous and very strongly compressed throughout; black, with apices of all the segments, and base of the first three broadly, flavous; basal segment thrice as long as apically broad and sublinear, with the spiracles but slightly before the centre, and thence parallel-sided, a little broader and subcanaliculate to apex; terebra straight, slender and slightly longer than abdomen. *Legs* flavescent, with hind femora fulvous; hind legs with apical half of coxæ, apices and extreme base of femora and tibiæ, quite black, posterior onychii infuscate; hind calcaria unequal, front ones short and sinuate. *Wings* entirely hyaline, ample but not broad, with radix and tegulæ stramineous, costa and stigma piceous; areolet subpetiolate, higher than broad, and emitting the unifenestrate recurrent nervure from hardly before its apex; first recurrent of hind wings distinctly postfurcal, emitting the curved nervellus from hardly below its centre.

Fig. 57.—*Syzeuctus compressus*, Morl.

Length 12 millim.

Sikkim, iv.–vi. 1900 (*Col. Bingham*).

Type in the British Museum.

The strongly compressed abdomen gives this species a very striking superficial resemblance to the Xorid genus *Tropistes*, but the conformation of the head, areolet and elongate legs is very distinct.

Described from two females.

166. **Syzeuctus claripennis**, *Cam.*

Lissonota claripennis, Cameron,* Journ. Bombay Nat. Hist. Soc. xiv, 1902, p. 427 (♂).

♂. A bright flavous species, broadly marked discally with black; the wings entirely hyaline and the abdominal spiracles

abnormally large. *Head* very finely punctate, with pale pubescence; occiput and vertex black, with only the orbits broadly flavous, frons centrally black to the antennæ; the convex face and subdiscrete clypeus immaculate flavous; mandibles flavous, with the subequal apical teeth piceous. *Antennæ* about as long as body, filiform and apically subattenuate; fulvous, becoming basally infuscate above and flavous beneath. *Thorax* not elongate, closely and not very finely or evenly punctate, with pale pilosity; flavous, with mesopleural lines at both extremities and coalescing below radices, mesonotum and frenum (except hamate lines on former which coalesce in a discal spot), and the metanotum triangularly on either side, black; notauli wanting; metathorax entirely without costæ and its spiracles transverse, elongate and not large. *Scutellum* and postscutellum immaculate. *Abdomen* black, linear and subglabrous, with the base of the first and apices of all the segments narrowly flavous; three basal segments distinctly elongate, first glabrous and not impressed, the following very finely punctate; anus red; spiracles of the third segment large, of the following gigantic, cavernous and quite circular. *Legs* slender and flavous, with the hind femora fulvous and the intermediate piceous-lined above; hind coxæ internally only and the base of their trochanters black, their tarsi immaculate fulvidous. *Wings* hyaline throughout, with the stigma and nervures fulvous, radix and tegulæ flavous; areolet about as long as its petiole, with the outer nervure curved and subpellucid below; nervellus not strong, intercepting the nearly straight first recurrent of hind wings slightly below its centre.

Length 9 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*, type); MADRAS: Madras *W. Elliott*); CEYLON: Heneratgoda (Brit. Mus.).

Type in Col. Nurse's collection.

This species exactly resembles *S. zanthorius* in outline and is very similar in the colour-scheme, but the unclouded alar apices and the extremely remarkable conformation of the abdominal spiracles, which are so large that at first I suspected some parasites had emerged from the perfect insect, though their regularity precludes any such assumption, render it abundantly distinct.

167. **Syzeuctus annulipes**, *Cam.*

Mesoleptus annulipes, Cameron, Manch. Mem. 1900, p. 103 (♂).

♀. A small slender black species, with profuse flavous markings, the legs mainly red and the wings apically infumate. *Head* black and abruptly declivous behind the entire and internally parallel eyes; occiput vertical, not emarginate, and glabrous, like the laterally flavous frons; scrobes small and not centrally carinate; face quadrate, closely and evenly punctate, centrally prominent and laterally narrowly flavescent; clypeus convex, subglabrous and, with mandibles and palpi, flavous. *Antennæ*

very slender and apically attenuate, with the joints not discrete; scape and base of flagellum testaceous beneath. *Thorax* evenly, closely and not very finely punctate; black, with a hamate mark on either side of mesonotum in front, small callosities beneath all the radices, and conspicuous spots above the hind coxæ, flavous; metathorax with no costæ and not strongly convex. *Scutellum* flavous, convex, with a few fine punctures. *Abdomen* almost linear and very strongly deplanate to the apex of the third segment; the first three segments broadly flavous at the base, the apices of the second and third, together with the compressed and clavate anus, being also flavous; basal segment glabrous and sublinear, thrice as long as apically broad, slightly curved laterally before its apex, with the spiracles very slightly before its centre; terebra as long as the abdomen without the basal segment, very slender and apically deflexed. *Legs* red, anterior coxæ and trochanters flavous; hind legs elongate, with the base of their black tibiæ and tarsi white; hind femora infuscate at apex, and their calcaria of unequal length. *Wings* narrow and not large, hyaline, with a circular dot on the front margin slightly before the apex conspicuously infumate; radix flavous, costa and stigma piceous; areolet petiolate, not broader than high, longer than its petiole, and emitting the broadly pellucid recurrent nervure from near its apex.

Fig. 58.—*Syzeuctus annulipes*, Cam.

The ♂ differs slightly in having the whole face, cheeks, scape beneath, prothorax and anterior margin of mesothorax, as well as apex of fourth segment, flavous; the antennæ slightly longer and abdomen more slender.

Length 7½ millim.

Assam: Khasi Hills, 1000–3000 ft., iii. 07 (Pusa coll.); Bengal: Pusa, xii. 05 (Pusa coll.), Chapra (*Mackenzie*), Adra, x. 09, and Monghur, ix. 09 (*J. T. Jenkins*—Ind. Mus.), Karmatar, x. 09, and Bhogaon, ix. 05 (*C. Paiva*—Ind. Mus.), Calcutta (Ind. Mus.): Madras: Mysore (Oxford Mus.), Tenmalai, Travancore (*Annandale*); Ceylon: Pundaluoya, ii. 95 (*E. E. Green*), Colombo, xii. 04 (*O. S. Wickwar*), Peradeniya, xii. 07, and Madulsima, v. 08 (*T. Bainbrigge Fletcher*). Queensland (*Rowland Turner*).

Type in the British Museum.

This species is, I consider, a true *Syzeuctus*, in spite of its minute and reniform metathoracic spiracles, by means of which it may at once be recognised. I do not know Förster's genus *Aphanodon*, which appears to differ from *Cryptopimpla*, synonymised with it by Dalla Torre, in the absence of the transverse metanotal apical carina. The apically infumate wings and white-marked legs are very distinctive. The markings are peculiarly constant.

No doubt can remain that this is a common and widely distributed species throughout India, from Assam to Ceylon, though we at present know nothing of its economy, which is undoubtedly related to the Lepidoptera; and further, I have seen several examples, which I am unable to differentiate, in the collection formed by Mr. R. Turner in Queensland, where it is apparently not uncommon. It was first sent from Ceylon to the British Museum by Dr. Thwaites about 1867.

168. **Syzeuctus zanthorius**, *Cam.*

Lissonota zanthoria, Cameron,* Journ. Bombay Nat. Hist. Soc. xiv, pt. iii, p. 426 (♂).

♂. A bright flavous species, with black markings, unicolorous red antennæ and apically infumate wings. *Head* not vertically declivous behind the internally parallel eyes, fulvescent-flavous, with only the bordered occiput centrally below, and the space between the flavous ocelli, black; vertex higher than eyes, glabrous and impressed on either side of the ocelli; frons distinctly and evenly punctate, with a minute and obsolete excrescence between the reticulate and small scrobes; face and clypeus distinctly and evenly punctate throughout, subdiscrete, with the latter a little convex and apically rounded; mandibles stout, with the upper of the nigrescent teeth a little the longer; cheeks not short. *Antennæ* fulvous throughout and distinctly a little compresso-dilated beyond the centre; the joints cylindrical and neither elongate nor discrete. *Thorax* distinctly and not very finely punctate throughout, clear flavous, with a small black mark in centre of front of mesonotum, another on its disc, and lateral vittæ basally coalescing at the scutellar fovea, dots above radices and a small oblique fascia on either side of the wanting areola, black; metathorax with no costæ and the lateral carinæ entirely wanting, spiracles elongate transverse and not large. *Scutellum* flavous, nitidulous, subconvex, deeply and not very closely punctate. *Abdomen* parallel-sided, distinctly punctate, flavous, with all the segments centrally black; anus pilose and fulvescent, with the valvulæ not exserted; basal segment smoother, not canaliculate nor constricted basally, with spiracles obsolete at its basal third. *Legs* flavous and slender; tarsal claws submutic; hind femora and tibiæ pale fulvous, their tarsi darker, trochanters basally infuscate, and the pale calcaria strongly unequal. *Wings* clear hyaline, with the apices alone infumate; radix and

tegulæ flavous, stigma piceous and basally flavescent; areolet triangular, externally pellucid below, as long as its petiole, and emitting the recurrent nervure from its apical third; first recurrent of lower wings postfurcal and straight, emitting the weak and apically curved nervellus from its lower third.

Length 9½ millim.

The size and shape of the black thoracic markings are said to be variable.

♀. Differs materially in colour, but in structure appears identical. The *head* is flavous with the occiput except behind the eyes, centre of vertex, of frons, and very narrowly of face, black. *Thorax* black with hamate marks on front of, and another on disc of mesonotum, pronotum mainly, mesosternum laterally, a subcircular mark on mesopleuræ, lines before and callosities beneath radices, metapleuræ basally, circularly at apex and before spiracles, as well as its entire apex extending discally to centre, flavous. Scutellum and postscutellum concolorous. *Abdomen* black, with apices of all the segments, and base of the subglabrous first, flavous; terebra straight and slender, as long as abdomen and metathorax. *Legs* as in male, with hind coxæ broadly black internally and to a less extent externally.

Length 9–12 millim.

PUNJAB (Brit. Mus.); BENGAL: Pusa, iv. 07, and Chapra (Pusa coll.); CENTRAL INDIA (*Hearsey*—Oxf. Mus.); BOMBAY: Deesa, x. 99 (*Col. Nurse*, type), Poona, viii. 86 (*R. C. Wroughton*), Bombay (Brit. Mus.).

Type ♂ in Col. Nurse's collection.

Col. Nurse has allowed me to examine Cameron's male type of his *Lissonota zanthoria*, which I have described above; its elongate metathoracic spiracles, however, exclude it from that genus. I have seen another male and five females, which undoubtedly belong to it, on account of their sculpture and especially that of their subdilated flagellum.

169. **Syzeuctus baluchistanensis**, *Cam.*

Lissonota baluchistanensis, Cameron, Journ. Bombay Nat. Hist. Soc. xvii, 1906, p. 284 (♀).

Lissonota apicipennis, Cameron, Journ. Bombay Nat. Hist. Soc. xiv, 1902, p. 426 (♀).

♀. A pretty, flavous-marked species, with the abdomen red, and the wings apically infumate. The sculpture and conformation are in all respects identical with those of the last described species, excepting only that the flagellum is not apically dilated and the terebra is fully as long as the abdomen and whole thorax. Head, thorax, scutellum, coxæ and trochanters bright flavous. Occiput, vertex and frons to scrobes, broadly black in the centre; mandibles apically infuscate. Mesopleuræ margined throughout with black, except apically below, metathorax with a triangular black mark on either side, meso- and metasternum very narrowly,

and the mesonotum (except large anterior hamate marks coalescing with a broad discal spot) black. Hind coxæ internally black and externally ferruginous below. Abdomen clear red, with apices of all the segments narrowly, and base and apex of the first somewhat broadly, flavous. Hind femora, tibiæ and tarsi fulvous throughout, their trochanters basally blackish. Wings as in the last described species.

Length 14 millim.

BALUCHISTAN: Quetta, vii. 02 (*Col. Nurse*).

Type in Col. Nurse's collection.

Var. **apicipennis**, *Cam.*

♀. Differs in nothing but the colour and rather smaller size. The meso- and meta-thoraces are entirely black, with the callosities below the radices and large triangular marks before them, flavous; the base and apex of the first abdominal segment are more narrowly flavous, and the base of the three following segments is centrally black.

Length 11 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

So similar does this female appear to *S. xanthorius* that I should certainly have synonymised them as mere colour varieties, were it not that the terebra is distinctly longer and the flagellum is not compresso-dilated beyond its centre.

Genus **LAMPRONOTA**, *Hal.**

Lampronota, Haliday, Ann. Nat. Hist. ii, 1839, p. 120.

GENOTYPE, *Ichneumon accusator*, F.

Clypeus discrete and apically subtruncate; frons convex and subglabrous. Antennæ elongate, filiform and somewhat slender; flagellar joints not discrete, the first usually elongate, ♂ with the fourth and either the third or fifth externally excised. Thorax stout, gibbulous-cylindrical; mesonotum anteriorly elevated and perpendicular, notauli very deeply impressed; metathoracic areola coalescing with basal area, its longitudinal costæ straight, parallel and entire from base to apex; lateral costæ distinct; petiolar area short; spiracles oblong and transverse. Abdomen subsessile, evenly convex; basal segment usually dull, scabriculous and convex; anus subcompressed and laterally clavate, of ♀ with the venter apically cleft, the valvulæ obtuse and the terebra about the length of the abdomen. Hind legs distinctly a

* The name *Lampronota* was, as is truly stated by Dalla Torre (Cat. Hym. iii, p. 514), brought forward by Curtis in 1832 (Brit. Ent., fol. p. 407), but, as there directly expressed, purely as synonymic with *Lissonota*, Grav. (1829); consequently Haliday's later name must stand.

little stout, their tarsi and tibiæ often dark; tarsal claws simple. Areolet entirely wanting.

Range. North America, Cuba, Europe, Sikkim.

Probably the most natural position for this very distinct genus is among the ACÆNITIDES, as was originally suggested by Haliday; the deep notauli and incrassate hind legs are very similar, but, wherever placed, the unique conformation of the ♂ flagellum will render that sex abundantly distinct; both sexes are at once known from the remainder of the LISSONOTIDES by the entire longitudinal metathoracic carinæ and, though with more uncertainty (for some species of *Lissonota* and *Meniscus* are exceptions in this respect), by the absence of all trace of the outer nervure of the areolet.

170. **Lampronota quintana**, sp. n.

♂. A small black species, with pale legs, and the fourth and fifth flagellar joints externally emarginate at the base. *Head* nitidulous, with the vertex obsoletely punctate, deeply impressed longitudinally on either side before the prominent and entire eyes; occiput bordered and deeply emarginate; face distinctly and evenly punctate, deplanate and strongly produced above, with coarse white pilosity; clypeus dull testaceous, subglabrous and small, apically truncate and basally semicircularly discrete; mandibles testaceous, with equal teeth; cheeks elongate and buccate, palpi pure white. *Antennæ* longer than body, filiform and not very slender; the flagellum piceous beneath, its basal joint hardly longer than the scape and as long as second, the fourth and fifth joints distinctly constricted externally throughout their basal half, and the latter obtusely dentate at its apical third. *Thorax* immaculate and nitidulous, with the finely scabriculous metanotum centrally bicarinate to near its apex, and laterally strongly carinate throughout above and below the spiracles. *Scutellum* strongly nitidulous, with a few fine punctures. *Abdomen* strongly shining, black, with the gastrocœli of the second and third segments translucently testaceous, and the extreme apices of the fifth and following white; basal segment gradually slightly widened throughout and laterally margined, scabriculous and bicarinate to near apex, with the spiracles distinctly before its centre; venter testaceous and plicate, valvulæ large and concolorous. *Legs* fulvous, with all the coxæ, base of trochanters, and the hind onychii black. *Wings* hyaline, with

Fig. 59.
Lampronota quintana, Morl.

radix and tegulæ testaceous, stigma piceous and the bifenestrate second recurrent nervure emitted by the cubital far beyond the submarginal; first recurrent of hind wings emitting the nervellus almost from its junction with the posterior nervure.

Length 5½ millim.

SIKKIM: Rungarum, 5700 ft., iv. 1900 (*Col. Bingham*).

Type in the British Museum.

This very distinct species may be known from all others by the structure of its flagellum. Described from a single specimen.

Tribe *BANCHIDES.*

In spite of all that has at various times been written by Holmgren, Thomson and other authors to the contrary, I am still of the opinion expressed in my volume on the British PIMPLINÆ, that this aberrant group of Ichneumons bears features of closer relationship with certain PIMPLINÆ than with the OPHIONINÆ or TRYPHONINÆ, among which they are usually placed. On the one hand, they resemble *Acœnitus* in the subsessile abdomen, narrow wings and elongate legs, and, on the other, their relationship with the Lissonotid genus *Meniscus* is well attested by Gravenhorst, who described the same insect, under different names, in both groups. The rhomboidal areolet, which character is somewhat strained in the Oriental representatives, and subsessile abdomen exclude them from the ICHNEUMONINÆ and CRYPTINÆ; the lack of a distinct petiole also will not permit of their inclusion in the OPHIONINÆ; and the distinctly exserted ovipositor of at least *Tegona* and *Exetastes*, seems to preclude them from the TRYPHONINÆ, wherein the anus is never distinctly compressed as in *Banchus*, though this feature is met with to a modified extent in the ACÆNITIDES. They appear to be parasitic exclusively on the Lepidoptera, among which they evince a predilection for the NOCTUIDÆ.

Table of Genera.

1 (2)	Tarsal claws not pectinate	EXETASTES, Grav., p. 243.
2 (1)	Tarsal claws more or less distinctly pectinate below.	
3 (8)	Frons simple; areolet irregularly rhomboidal.	
4 (5)	Clypeus elongately produced; cheeks longer than base of mandibles	TEGONA, gen. n., p. 251.
5 (4)	Clypeus of normal length; cheeks shorter than base of mandibles.	
6 (7)	Eyes internally broadly emarginate; notauli elongate	BANCHUS, F., p. 253.
7 (6)	Eyes internally entire; notauli wanting	FINTONA, Cam., p. 257.
8 (3)	Frons bidentate; areolet irregular and internally produced..............	EPONITES, Cam., p. 258.

Genus EXETASTES, *Grav.*

Exetastes, Gravenhorst, Ichn. Eur. iii, 1829, p. 395.

Genotype, *Ichneumon cinctipes*, Retz.

Head short and transverse, somewhat produced in front, not buccate posteriorly and often white-marked; clypeus subdiscrete and a little broader than long, more or less impressed, basally elevated and apically rounded but not excised; mandibles broad, curved, subconstricted apically, with the teeth of nearly equal length; maxillary palpi simple; eyes entire and not emarginate. Antennæ slender, filiform or subsetaceous, with the scape ovate and apically hardly excised. Thorax somewhat narrow; epicnemia distinct; metathorax stout, usually parallel-sided and dorsally scabriculous; areæ obsolete or wanting; spiracles oval and not large. Scutellum simple, convex or gibbous, especially when not pale. Abdomen narrow, subsessile and compressed at the apex, smooth and nitidulous; petiolar spiracles a little before the centre; second and third segments margined; terebra distinctly exserted. Legs slender, with hind pair elongate; posterior tibiæ bicalcarate, with the tarsal claws simple. Wings normal, often a little clouded; areolet irregularly rhomboidal; radius emitted slightly before the centre of the stigma, nervelet usually distinct; hind wings with the nervellus intercepted above the centre and the first radial abscissa only half the length of the second.

Range. Europe, Madeira, Teneriffe, Himalayas, Malay Archipelago, North America, Brazil.

Thomson points out (Op. Ent. xxii, p. 2414) that this genus is separable from *Banchus* by its entire eyes, which, though not uniform in shape, are never emarginate, the subentire scape and simple scutellum; the external orbits are not flavidous, the mandibles have the upper tooth obliquely truncate and somewhat longer than the lower, and the areolet, though large and rhomboidal, is yet smaller and seldom sessile; the recurrent nervure of the hind wings intercepts the radius in its first third and is shorter and slightly oblique.

Table of Species.

1	(4)	Hind metatarsus clear red.	
2	(3)	Mesonotum finely and obsoletely punctate; length 8–12 millim.	*cinctipes*, Retz., p. 244.
3	(2)	Mesonotum closely and coriaceously punctate; length 14 millim.	*tisiphone*, sp. n., p. 246.
4	(1)	Hind metatarsus infuscate or black.	
5	(6)	Mesonotum glabrous and less convex .	*nigripes*, Grav., p. 247.
6	(5)	Mesonotum punctate and more convex.	
7	(8)	Frons closely punctate and dull; areolet subsessile	*lucifer*, sp. n., p. 248.

8 (7) Frons sparsely punctate; areolet subpetiolate.
9 (10) Metanotum convex, not sulcate, with all costæ wanting .... *nitidus*, Cam., p. 249.
10 (9) Metanotum centrally strongly sulcate, with basal costæ .... *fornicator*, F., p. 250.

171. **Exetastes cinctipes**, *Retz.*

Ichneumon atrator, Förster, Nov. Spp. Ins., 1771, p. 84 (♀); *cf.* Gravenhorst, Ichn. Eur. iii, 1829, p. 903 (?).
Ichneumon cinctipes, Retzius, Ins. 1783, p. 168 (♀).
Ichneumon osculatorius, Fabricius, Mant. Ins. i, 1787, p. 261 (♂).
Ichneumon clavator, Fabricius, Ent. Syst. ii, 1793, p. 151 (♀).
Ophion clavator, Fabricius, Piez. 1804, p. 134 (♀).
Ophion tarsator, Fabricius, *l. c.* (♀).
Exetastes osculatorius, Gravenhorst, Ichn. Eur. iii, 1829, p. 413 (♂).
Exetastes clavator, Gravenhorst, *l. c.* p. 405 (♀); Vollenhoven, Pinac. pl. xvii, fig. 3 (♂ ♀).
Tryphon tarsator, Zetterstedt, Ins. Lapp. 1840, p. 386.
Exetastes tarsator, Holmgren, Sv. Ak. Handl. 1858, no. 8, p. 159 (♂ ♀).
Exetastes cinctipes, Thomson, Opusc. Ent. xxii, 1897, p. 2414; Morley, Ichn. Brit. iii, 1908, p. 291 (♂ ♀).

♂ ♀. A black and slender species, with the metatarsus always, and most of the ♂ abdomen, red. *Head* somewhat narrowed behind the eyes; face evenly and distinctly punctate; ♂ with the palpi testaceous and basally infuscate, the mandibles (except their infuscate teeth), the face and cheeks, flavous; clypeus shagreened and deplanate, with a few scattered punctures and the apex subtruncate, of ♂ flavous and of ♀ rarely badious. *Antennæ* setaceous and about as long as the body, with the basal flagellar joint nearly twice as long as the second; of ♂ with the scape usually pale below, of ♀ with eight or nine of the central joints white. *Thorax* narrower than the head, punctate and somewhat nitidulous; of ♂ with a line before, and another transversely beneath, the radix and sometimes two pectoral marks, flavous; metathorax dorsally evenly subrugulose throughout, with no trace of areæ or petiolar costa; spiracles linear. *Scutellum* distinctly punctate and black, of ♂ nearly always apically flavidous or white; postscutellum basally bifoveolate. *Abdomen* glabrous and nitidulous, black; in ♀ immaculate, in ♂ with the apex of the basal segment sometimes castaneous, the second and third usually mainly red, the fourth black and nearly always with its base rufescent, its ventral plica pale testaceous; basal segment slightly curved and gradually dilated apically, with the postpetiole nearly double the width of the petiole; second and third segments of about equal length; terebra half the length of the basal segment. *Legs* slender, pale red, with the finely punctate coxæ and trochanters black, or in ♂ with the anterior flavidous beneath; tarsi always red, with the three central joints of the hind ones stramineous; anterior tarsi of ♀ infuscate. *Wings* hardly clouded and not

broad, with the narrow stigma rufescent; tegulæ of ♂ flavidous or ferruginous, of ♀ piceous; areolet subsessile; nervellus intercepting far above the centre.

Length 8–12 millim.

Among several hundreds of this species which I have bred in England the variation is surprisingly small. In both sexes the second to fourth hind tarsal joints are normally white, rarely flavous after death, and occasionally with the base of the fifth concolorous; the extent of sessility of the areolet varies somewhat and it is sometimes subpetiolate; the nervelet is also of variable length and often obsolete. The ♂ has the scutellum usually flavous at its apex, sometimes the apical half or the whole scutellum (except its base) is flavous, at others it is entirely black or with two subobsolete flavous spots at its extreme apex; the ♂ antennæ, which normally bear no central pale band, occasionally exhibit more or less distinct traces of one, and very rarely the band is quite evident; the mesonotum is laterally flavous in typical examples, but sometimes more or less castaneous, or with this colour reduced to mere dots, rarely entirely wanting; the mesopleuræ, generally in part flavous, are sometimes immaculate; the pronotum is occasionally flavous or bimaculate; the ♂ abdomen is never quite black, though the extent of the rufescent coloration is very variable; the femora are very rarely infuscate, almost always pale at their extreme base, which is very rarely quite white. The ♀ varies but very slightly in having the usually entirely black abdomen rufescent at the thyridii and apical margin in the second segment; and its intermediate femora are almost always nigrescent towards their base.

It will, however, be found that the clear red basal hind tarsal joint at once distinguishes this species from all others of its genus, except my new *E. tisiphone*.

A detailed description of the larva (first described by me in Ent. Mo. Mag. 1903, p. 163) and cocoon (*cf.* De Geer, Mem. ii, p. 849, pl. xxix) of this species is given in my "British Ichneumons" (iii, p. 293), where it is also stated that the host-caterpillar is consumed before attaining the pupal state; that the parasitic larvæ probably evacuate their hosts while the latter are passing the daytime below ground, and there spend the winter, since their cocoons are usually found whilst potatoes are being dug in the autumn. A large percentage of the pupæ are destroyed by mould and the hyperparasitic attacks of the Ophionid *Mesochorus mandibularis*, Thoms., and a species of CHALCIDIDÆ. The time of emergence is during June and July in Britain.

In Europe it is an extremely abundant species in gardens throughout the central and northern regions, extending to Lapland; it has been bred from *Mamestra brassicæ*, *Hadena oleracea*, *Retinia pinicolana* and *Miana furuncula*, and may be frequently observed on umbelliferous flower-heads. The only Oriental example I have seen is a ♂ from Westwood's collection, now in the Oxford Museum, which is labelled "India, Boys."

172. **Exetastes tisiphone**, sp. n.

♂. A black and somewhat slender species, with the metatarsus and whole legs (except basally) red. *Head* somewhat broad behind the eyes; face evenly and distinctly punctate, with the palpi infuscate and the mandibles equally acutely bidentate; clypeus glabrous, with a row of distinct punctures before its evenly rounded apex; cheeks fully as long as the basal width of the mandibles. *Antennæ* black, filiform, and about as long as the body, with the basal flagellar joint half as long again as the second. *Thorax* not narrower than head, closely and coriaceously punctate throughout and somewhat dull, with no pale radical marks; metathorax with fine erect pilosity, but no carinæ; spiracles linear. *Scutellum* distinctly punctate and black, not very shining, with its basal fovea conspicuously glabrous. *Abdomen* linear, impunctate and very strongly nitidulous, entirely black; basal segment more than twice as long as apically broad, very slightly widened throughout, with the somewhat conspicuous spiracles before the centre; spiracles of second and third segments at their basal two-thirds; ventral valvulæ exserted and somewhat large. *Legs* slender and elongate, pale red, with only the finely punctate coxæ and trochanters black; four apical joints of hind tarsi stramineous, their claws red, slender and simple. *Wings* a little siliceous, with the narrow stigma rufescent; tegulæ black; areolet subsessile, emitting the broadly fenestrate recurrent nervure from its centre; internal cubital nervure with elongate nervelet; radius very slightly curved above areolet.

Fig. 60.—*Exetastes tisiphone*, Morl.

Length 14 millim.

SIKKIM, 4000 ft., iv. 94 (*Col. Bingham*).

Type in the British Museum.

This species is closely allied to *E. cinctipes*, Retz., in its metatarsal colour, though the body is deep shining black, which, together with the mesonotal punctation, more closely allies it to *E. fornicator*, Fab. The elongate nervelet is similar to that of *E. femorator*, Desv. Described from a single specimen.

173. **Exetastes nigripes**, *Grav.*

Exetastes nigripes, Gravenhorst, Ichn. Eur. iii, 1829, p. 416, excl. var.; Ratzeburg, Ichn. d. Forst. iii, 1852, p. 94; Holmgren, Sv. Ak. Handl. 1854, p. 26; *op. cit.* 1858, no. 8, p. 153; Thomson, Opusc. Ent. xxii, 1897, p. 2315 (♂ ♀).

Var. *Exetastes illusor*, Gravenhorst, *op. cit.* p. 427; Holmgren, *op. cit.* 1858, no. 8, p. 151; Thomson, *op. cit.* p. 2416 (♂ ♀); Morley, Ent. Mo. Mag. 1903, p. 160 (♀); *cf.* Vollenhoven, Pinac. pl. xvii, fig. 4.

♂ ♀. Shining, punctate, black. *Head* punctate and somewhat narrowed behind the eyes; of ♀ immaculate, of ♂ usually with a mark at the clypeal orbits, and another at the centre or base of the mandibles, flavous; clypeus deplanate, a little elevated basally and rounded apically; mandibles curved, with the teeth of equal length. *Antennæ* setaceous, about as long as the body and strongly attenuate towards their apices, with the basal flagellar joint one-third longer than the second. *Thorax* stout, gibbous, punctate and narrower than the head; metathorax rugose, or in ♂ strongly punctate above, with the areæ incomplete and spiracles linear. *Scutellum* black. *Abdomen* fusiform, glabrous and nitidulous, apically subcompressed, narrower than the thorax; black, with the apex of the first segment and whole of the second to fourth red, or with the two latter apically infuscate; basal segment narrow, nearly thrice as long as broad, slightly dilated apically, with the tubercles a little prominent; second and third of equal length, the fifth rarely basally rufescent; terebra half as long again as the basal segment, with linear valvulæ. *Legs* very long, the anterior pairs slender; front ones more or less fulvescent or ferruginous, with the coxæ, trochanters and base of femora always black; hind ones not slender, nearly always entirely black, though rarely with the tibiæ basally ferruginous; ♂ with the third and fourth hind tarsal joints white. *Wings* slightly clouded; stigma infuscate-fulvescent, tegulæ black, radix and radius infuscate; areolet sessile.

Length 7–11 millim.

Sikkim: Darjiling, 6000 ft., x. 05 (*E. Brunetti*). Europe.

Type in the Breslau Museum.

Holmgren says it may be known by the colour of the legs, adding that the wing nervures are similar to those of *E. femorator*, from which Thomson distinguishes it solely by the colour of the hind femora.

This species varies very considerably in the colour of the legs and also slightly in the markings on the head of the ♂; in my ♂ ♂ of the var. *illusor*, which has the abdomen red, the anterior coxæ and trochanters are broadly marked with flavous, and the scutellum apically dotted with the same colour; Gravenhorst mentions a ♀ with the hind tarsi infuscate throughout: and I have a ♀ intermediate in coloration between the typical

and varietal forms, having the legs black, with the anterior tibiæ and the basal half of the hind femora red.

A remarkable abnormal ♂ of this species, taken by Dr. Capron in Surrey, is now in my collection, in which the nervellus does not touch the first recurrent nervure at all, but is emitted by the median a quarter of a millimetre beyond the emission of the first recurrent; in all other respects the specimen is normal, with red legs and immaculate scutellum.

This species is not uncommon on the continent of Europe in June in woody and grassy places; Ratzeburg has bred it in Germany from *Diacrisia lubricipeda* and *Cucullia artemisiæ* in July; Dr. Giraud has raised the var. *illusor* in France from *Pieris brassicæ*, and, in Prussia, Brischke also bred it from *Hadena contigua*. It is by no means an uncommon species in Britain, though the type form appears to be much the rarer.

It has been bred from a dozen Bombycid and Pierid hosts, but especially from the pupæ of Noctuid moths, and is very beneficial in destroying such pests as *Pieris brassicæ*, *Polia oleracea* and *Barathra brassicæ*.

The only Indian specimen I have seen is a male, taken by Brunetti at Darjiling along with several Palæarctic Bassids, and this circumstance strengthens my conviction that the insect is nothing but a melanic form of the var. *illusor*, Grav., with red hind femora, of this common species. It is, however, a somewhat small specimen of only 8 millim., with the abdomen immaculate black, though in all other particulars entirely typical.

174. **Exetastes lucifer**, sp. n.

♂. A bright species, with pale scutellum and red abdomen. *Head* transverse and somewhat narrowed behind the eyes; face, clypeus and mandibles pubescent, dull, closely punctate and flavous; clypeus subdiscrete, not short, centrally impressed, apically rounded and brunneous; epistoma prominent. *Antennæ* elongate, apically gradually attenuate and as long as the body, with the twelfth to nineteenth flagellar joints flavous throughout, and the basal only one-third longer than the second. *Thorax* stout and punctate, black, with only the pronotum white; mesonotum closely and very finely punctate, with no trace of notauli; metathorax very strongly punctate, with the areæ and apophyses entirely wanting, petiolar area barely indicated basally; spiracles linear. *Scutellum* bright flavous, with its extreme base alone black. *Abdomen* fusiform, glabrous and subnitidulous, pilose and broadest behind the centre; red, with the extreme base and three or four anal segments infuscate; first segment slightly curved and a little dilated towards the apex, with the postpetiole but slightly broader than the petiole; second and third segments subequal in length; anus subcompressed, with the valvulæ not exserted. *Legs* normal and red; coxæ and trochanters black, with the front ones flavous beneath; hind tarsi, apices of their

tibiæ and of their femora, black, the central joints of the tarsi clear white. *Wings* subhyaline, with the stigma and radix clear fulvous; tegulæ entirely stramineous and the nervelet short.

Length 10 millim.

ASSAM (*W. F. Badgley*).

Type in the British Museum.

This species is extremely closely allied to the common European *E. guttatorius*, Grav., and indeed may be little more than a local form, though materially differing in the colour of its head and legs, as well as in having the hind legs much longer, abdomen duller, head broader, mesonotum less closely punctate and more nitidulous, metathorax distinctly larger, areolet much more oblique with its outer nervure quite straight, the radius less curved and the nervelet longer. I have seen but a single example.

175. **Exetastes nitidus**, *Cam.*

Exetastes nitidus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 274 (♀).

♀. A stout black species, with the abdomen and legs mainly red, the petiole short and the wings slightly clouded. *Head* stout and subbuccate behind the somewhat small eyes; vertex finely and sparsely punctate, frons closely and evenly; face equally evenly

Fig. 61.—*Exetastes nitidus*, Cam.

punctate, clypeus and centre of mandibles ferruginous. *Antennæ* immaculate black, as long as body, attenuate towards the apices and at base, with the first flagellar joint curved and twice as long

as the second. *Thorax* stout and black, with the mesonotum irregularly and obsoletely punctate, subglabrous; metathorax with no costæ, basally impressed in the centre; petiolar area short and subconcave, spiracles linear. *Scutellum* black, a little convex, with distinct punctures. *Abdomen* glabrous, nitidulous, red, with the first segment basally and anus from apex of fourth black; basal segment but slightly longer than apically broad, discally impressed in the centre, impunctate, and gradually dilated throughout; terebra stout and black, somewhat shorter than the basal segment. *Legs* elongate and red, with all the coxæ, the anterior trochanters, hind ones basally, their tarsi, and basal half of their externally spinose tibiæ, black; hind calcaria strongly unequal. *Wings* obscurely siliceous, especially beyond the centre; radix and tegulæ ochreous, costa and nervures infuscate, stigma pale fulvous; areolet rhomboidal, subpetiolate, not higher than broad and emitting the strongly sinuate and broadly bifenestrate recurrent nervure from its centre; radius distinctly curved above the areolet; internal cubital broadly pellucid, with the nervelet elongate; nervellus emitted from the curved and very strongly postfurcal first recurrent nervure of hind wings very slightly below its junction with the median.

Length 11 millim.

Baluchistan: Quetta, v. 03 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species resembles *E. lævigator*, Vill., in its general conformation and colour, but the antennæ are much longer and the petiolar area ill-defined; in size, antennal conformation, the structure of the legs and wings, it exactly agrees with *E. fornicator*, F., of which it may be a variety, though lacking the metanotal costæ.

Col. Nurse has kindly allowed me to draw the above description from the unique type.

176. Exetastes fornicator, *F.*

Ichneumon fornicator, Fabricius, Sp. Ins. i, p. 432 (♀).
Banchus fornicator, Fabricius, Piez. 1804, p. 827 (♀).
Exetastes fornicator, Gravenhorst, Ichn. Eur. iii, 1829, p. 404; Holmgren, Sv. Ak. Handl. 1858, no. 8, p. 150; Vollenhoven, Pinac. pl. xvii, fig. 2; Thomson, Opusc. Ent. xxii, 1897, p. 2415 (♂♀).
Tryphon fornicator, Zetterstedt, Ins. Lapp. 1840, p. 386.

♂♀. A large, stout, black species, with often clouded wings and elongate unicolorous antennæ. *Head* somewhat broad behind the eyes, with fulvescent pilosity; frons very slightly impressed and punctate; face flat and distinctly punctate; mouth produced, with the apex of the shagreened clypeus deflexed throughout; mandibles subparallel-sided, with the teeth of equal length. *Antennæ* filiform, apically attenuate, those of ♂ as long as the body,

of ♀ somewhat shorter; basal flagellar joint nearly double the length of the second. *Thorax* stout and gibbulous; mesonotum distinctly and evenly punctate, metathorax rugosely punctate, strongly sulcate centrally, with the areæ obsolete and the spiracles linear. *Scutellum* convex and strongly punctate, black. *Abdomen* glabrous and nitidulous, fusiform and laterally clavate, as long as the head and thorax or slightly longer, black; basal segment quite twice as long as broad, gradually subdilated apically and punctulate laterally, with the tubercles a little before the centre; second and third segments rarely obsoletely badious, transverse and of about equal length, with the following segments shorter; terebra about half the length of the basal segment or one-sixth of the abdomen. *Legs* normal; bright fulvous, with all the coxæ and trochanters jet-back; hind ones longer and stouter, with their tarsi, except usually their fifth joint, and apices of their tibiæ infuscate. *Wings* usually considerably clouded, with the stigma and radix piceous or ferruginous; the tegulæ blackish; areolet hardly petiolate and emitting the recurrent nervure from near its centre; nervellus intercepted far above its centre.

Length 9–13 millim.

KASHMIR, 8000–9000 ft., vi. 01 (*Col. Nurse*). EUROPE.

This species is rendered abundantly distinct by its entirely black abdomen, which rarely has the second or third segment apically castaneous, the terebra nearly half the length of the first segment, and its elongate pulvilli. It is one of the largest Palæarctic species of this genus and I am unaware that its range has hitherto been known to extend outside Europe.

Brischke (Schr. Nat. Ges. Danz. 1882, p. 198) describes the cocoon as "cylindrical, with a thin shining black double cuticle."

It is said to be very common in Central Europe in woody and grassy places upon umbelliferous flowers from June to August, sometimes upon *Angelica sylvestris* in September, and rarely found as late as the beginning of October; it is a well-known parasite of *Polia oleracea* according to Van Vollenhoven, and Brischke has bred it in Prussia from *Empusada balsamitæ*. I was surprised to find a male in Col. Nurse's collection, taken in Kashmir.

Genus **TEGONA**, gen. nov.

Tegona, Cam. MS.

GENOTYPE, *T. rufipes*, sp. n.

The genus has all the superficial facies, the large areolet, subcompressed abdomen, exserted terebra and scabriculous metathorax, of *Exetastes*, but materially differs in the conformation of the clypeus, which is not transversely impressed but subcontinuous with the face, strongly elongate, beak-like, laterally straight and concave apically; the cheeks also are elongate and longer than the basal width of the mandibles; while the tarsal claws are so

strongly pectinate below as to be almost dentate. The corneous base of the rhomboidal areolet and the elongate legs are also remarkable.

Range. Simla.

I can find this genus described in none of Mr. Cameron's papers with which I am acquainted and, since a direct appeal to him for a knowledge of the publication has elicited no reply, I am led to regard it as a hitherto MS. name.

177. **Tegona rufipes**, sp. n.

Tegona rufipes, Cameron MS. (♀).

♂ ♀. *Head* not very broad behind the prominent eyes, vertex subconcave on either side, frons closely and finely punctate; face of ♂ flavous, of ♀ with a broad flavidous transverse fascia beyond its centre; clypeus very little convex, dull, with elongate setæ, hardly shorter than broad and apically concave, of ♂ flavous, and of ♀ with its apical half, a dot at apices of cheeks and the mandibles (except their strong teeth), flavous. *Antennæ* of ♂ rufescent, filiform and slender, becoming apically darker. *Thorax* subcylindrical and black, with a callosity in ♂ before and in ♀ below the radices, an obscure line before them and the apex of the subdeplanate scutellum, flavous; metathorax scabriculous-punctate with no costæ, the base slightly impressed centrally and the spiracles linear. *Abdomen* nitidulous and entirely red; basal segment elongate and subparallel-sided; terebra half the length of the basal segment, valvulæ with dark pubescence and apically obtuse, spicula red and strongly acuminate. *Legs* very long and red, with all the coxæ, trochanters, and in ♀ anterior femora above, black; onychii and apices of hind tibiæ infuscate; hind tarsi (except the fulvous basal two-thirds of their first joint) stramineous. *Wings* hyaline, slightly siliceous; radix, tegulæ, and stigma fulvidous, costa and nervures infuscate; areolet rhomboidal, with its short petiole broadly corneous, emitting the straight and unifenestrate recurrent nervure from its centre: nervelet distinct; upper basal nervure emitted from the median distinctly before the lower; radius slightly curved above the

Fig. 62.—*Tegona rufipes*, Morl.

areolet and apically reflexed; nervellus emitted from the curved and very strongly postfurcal first recurrent of hind wings very slightly below its junction with the median.

Length 14 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type ♀ in Col. Nurse's collection, ♂ in the Oxford Museum.

Genus BANCHUS, *F.*

Banchus, Fabricius, Ent. Syst. Suppl. 1798, p. 209.
Cidaphurus, Förster, Verh. pr. Rheinl. xxv, 1868, p. 159.

GENOTYPE, *Ichneumon volutatorius*, L.

Head shortly transverse, a little narrower than the thorax and constricted behind the subreniform and always internally emarginate eyes; clypeus subdiscrete and apically emarginate; mandibular teeth obtuse and unequal; maxillary palpi with the fourth joint of ♂ often strongly dilated, of ♀ a little incrassate. Antennæ somewhat slender, subfiliform, with the scape deeply excised; longer in ♂. Thorax convex; notauli elongate and, at least posteriorly, entire; metathorax short and scabrous with no areæ; apophyses stout and sometimes connected by a central carina; spiracles linear. Scutellum triangular and apically obtuse, gibbous or convex, often with a more or less acuminate discal spine. Abdomen sessile or subsessile, smooth and nitidulous, longer and usually narrower than the thorax, dorsally convex and laterally compressed especially in the ♀; basal segment hardly broader apically, slightly canaliculate, with the lateral tubercle before the centre; anus of ♂ obtuse, with segments five to seven very short, of ♀ with segments five to eight usually elongately exserted; terebra not or hardly exserted. Legs elongate and not unusually stout, their tarsal claws pectinate. Wings somewhat narrow, usually subfulvescent; areolet always entire, usually very large and irregularly subrhomboidal; stigma not small; radial cell lanceolate with its lower side often much curved.

Range. India, Europe, Canada, United States, Brazil.

W. A. Schulz has examined the type of *Banchus annulatus*, F., described from India, and states that it is a *Pompilus*, and conspecific with *P.* (*Episyron*) *multipictus*, Smith.

Table of Species.

1 (2) Scutellum with no trace of apical spine	*armillatus*, sp. n., p. 254.
2 (1) Scutellum with a very distinct apical spine.	
3 (4) Apical scutellar spine stout and straight	*flavomaculatus*, Cam., p. 255.
4 (3) Apical scutellar spine acuminate and deflexed	*nox*, sp. n., p. 255.

178. **Banchus armillatus**, sp. n.

♂. A small, black and yellow species, with fulvous femora. *Head* not very narrow behind the prominent and internally hardly emarginate eyes, stramineous, with the occiput broadly black above, and the frons and vertex bearing a common quadrate black spot; face nitidulous, very finely punctate and discrete from the apically margined clypeus by a semicircular sulcus; cheeks subobsolete; extreme apices of the broad mandibles black; palpi normal. *Antennæ* black, filiform and as long as body, with the scape and two basal flagellar joints flavescent beneath, and the twelfth to twenty-second joints clear white. *Thorax* black and somewhat shining; mesonotum with discal stripes and a hamate mark on either side in front, prothorax entirely, mesosternum and broad marks on their pleuræ, callosities before and beneath all the radices, and the apical half of the metathorax except a dot at its extreme apex, flavous; metanotum finely trans-aciculate throughout, its spiracles small, parallel-sided and very short, with apophyses obsolete. *Scutellum* glabrous, flavous and simply convex; postscutellum, and the apical lateral carinæ of both, concolorous. *Abdomen* glabrous and strongly nitidulous, apically pubescent, hardly longer than head and thorax, narrower than the latter and apically compressed; black, with the apical half of all the segments broadly flavous, as is also the subcanaliculate base of the apically unimpressed first segment; ventral fold strong, valvulæ black and exserted. *Legs* normal and flavous, with the tibiæ distinctly spinose; hind coxæ externally, their trochanters and tibiæ basally, apices of the latter broadly, and of their fulvous femora narrowly, black; tarsi nigrescent, the hind ones (except their apical joint) pure white, as are their calcaria which extend to centre of metatarsi. *Wings* clear hyaline, radix and tegulæ flavous, costa nigrescent, stigma centrally ferruginous; areolet distinctly small, transversely triangular, subpetiolate, and emitting the recurrent nervure hardly before its apex; radial cell sublanceolate, its nervure apically quite straight and basally curved; first recurrent of hind wing opposite, and emitting the nervellus but slightly above its junction with the posterior nervure.

Length 7 millim.

Nicobar Islands (*Col. Bingham*).

Type in the British Museum.

The small and distinctly triangular areolet, obsolete apophyses, very short spiracles and hardly emarginate eyes are somewhat incongruous in this genus, to which, however, this species is more closely related than any other yet erected; and I do not consider these minor distinctions worthy of generic rank.

Described from a single specimen.

179. **Banchus flavomaculatus**, *Cam.*

Cidaphurus flavomaculatus, Cameron, Zeits. Hym.-Dip. 1904, p. 346 (♂).

♂. A profusely black-marked red species, with only the mouth and pronotum flavous. *Head* not strongly constricted behind the internally emarginate eyes, ochreous, with the bordered occiput and ocellar region, frontal marks, cheeks, apices of mandibles and a parallel-sided and entire facial line, black; face deplanate and distinctly punctate, obsoletely discrete from the smoother clypeus; mandibles apically subtridentate, with the upper tooth the longer; palpal joints normal and cylindrical. *Antennæ* not elongate, apically attenuate, black, with the flagellum fulvidous and the scape ochreous beneath. *Thorax* stout, evenly and distinctly punctate, red, with profuse black markings; metathorax convex, scabrous, with indistinct punctures and its basal half black; petiolar costa alone laterally strong, spiracles elongate and apophyses obtuse. *Scutellum* and postscutellum red and strongly convex, the former with an apical short stout straight black spine. *Abdomen* strongly compressed throughout, nitidulous, obsoletely punctate and red, with the basal half of all the segments black; basal segment not impressed, constricted beyond the strongly dentiform spiracles at its basal third; ventral segments red; valvulæ subexserted. *Legs* red, with the hind trochanters, an external line on the posterior coxæ and another beneath all the femora, black; hind calcaria strongly unequal, front ones and the basal joint of their tarsi sinuate. *Wings* siliceous throughout; stigma and nervures piceous, radix and tegulæ ochreous; areolet rhomboidal, distinctly sessile and not large, emitting the recurrent nervure from its centre; discoidal cell apically acute below; radius slightly curved above areolet; nervellus emitted from the very strongly postfurcal first recurrent nervure of lower wings hardly before its junction with the median nervure.

Length 10 millim.

Punjab: Simla, v. 97 (*Col. Nurse*).

Type in Col. Nurse's collection.

The genus *Cidaphurus*, in which Cameron places this species, was distinguished from the remainder of *Banchus*, by Förster in 1868, by its possession of a scutellar spine, but since every other feature is analogous with Gravenhorst's genus, I do not consider it has any right to a separate existence; and I am not aware that any systematist has yet made use of it. A great many of Förster's genera are based upon trivial and sometimes merely sexual characters.

The present species strongly resembles the ♂ of our common European *Banchus pictus*; I have seen only the type.

180. **Banchus nox**, sp. n.

♂. A black species, profusely marked with flavous and its hind femora with red. *Head* narrow behind the internally strongly

emarginate eyes; bright flavous, with only the occiput, vertex, scrobes, a narrow longitudinal facial line and a spot at base of mandibles, black; face evenly punctate throughout, clypeus obsoletely discrete and apically sinuate. *Antennæ* not slender, apically strongly attenuate, a little shorter than body, black, with the scape and the basal flagellar joint (more obscurely) flavous beneath. *Thorax* somewhat dull, closely and finely punctate; mesonotum with hamate humeral lines, most of prothorax, large and small marks on meso- and meta-pleuræ, the frenum, and the entire petiolar area, flavous; metathorax scabriculous, with only irregular costæ at base of petiolar area; spiracles linear. *Scutellum* and postscutellum flavous, the former with a deflexed and acuminate black spine, nearly as long as its total length. *Abdomen* nitidulous, closely but obsoletely punctate, black, with the apices of all the dorsal and ventral segments broadly rufescent-flavous; basal segment sublinear, more than twice as long as apically broad, with the prominent spiracles distinctly before its centre; ventral valvulæ rufescent and subconcealed. *Legs*: anterior pairs flavous, with the tibiæ and tarsi rufescent, the femora with a black line below, the basal joint of front tarsi distinctly sinuate and pectinate, and its calcar equally curved; hind legs black, with the coxæ and extreme apex of trochanters with flavous marks, the femora entirely above and their tibiæ obscurely internally ferruginous; calcaria very unequal in length. *Wings* normal and subhyaline; radix and tegulæ flavous, costa piceous and stigma ferruginous; areolet normal, lower external angle of first discoidal cell acute; nervellus curved at its apex and intercepting the very strongly postfurcal recurrent nervure very slightly below its junction with the median.

Fig. 63.—*Banchu snox*, Morl.

Length 11 millim.

ASSAM: Shillong, Khasi Hills, 6000 ft., on flowers of *Spiræa*, x. 03 (*Rowland Turner*).

Type in the British Museum.

This species has much the facies of the common Palæarctic *B. pictus*, F., but is more profusely decorated, and the scutellar spine somewhat relates it to Wesmael's subgenus *Corynephanus*. Described from a single male.

Genus FINTONA, *Cam.*

Fintona, Cameron, Journ. Bombay Nat. Hist. Soc. 1909, p. 726.

GENOTYPE, *F. nigripalpis*, Cam.

The single female at present representing this genus is Cryptid in facies, with a triangular areolet of normal size. The basal segment is, however, distinctly sessile, as in *Cryptopimpla*, Tasch. (Zeits. Ges. Nat. 1863, p. 292), which it also resembles in its short terebra; here the analogy terminates; for the tarsi are distinctly pectinate and the flagellar joints cylindrical throughout. It nevertheless undoubtedly belongs to the PIMPLINÆ, among which the conformation of the areolet, claws, and thorax place it in the BANCHIDES, though some resemblance is exhibited to *Alloplasta*. The pectinate claws, simple frons and clypeus, abdominal sculpture and coloration will distinguish it in the present tribe. Its author, however, places this genus (*loc. cit.*) in the CTENOPELMINI tribe of TRYPHONINÆ, remarking on its relationship with *Eczetesis*, Först., and its Ophionid facies.

181. Fintona nigripalpis, *Cam.*

Fintona nigripalpis, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 726 (♀).

♀. A dull, black species, with the abdomen and legs mainly red. *Head* distinctly transverse and contracted behind the prominent eyes, dull black and closely punctate, with a short longitudinal sulcus before the central ocellus; face immaculate, broader than long and parallel-sided, evenly punctate and shortly white-pilose, with the epistoma slightly elevated and discrete from the convex piceous and subtriangular clypeus; mandibles nearly parallel-sided, apically curved and obtusely bidentate, basally white above; palpi stout and piceous, with the joints submoniliform and pilose. *Antennæ* nearly as long as the body, immaculate black, with the basal flagellar joints elongate and the apical subsetaceous. *Thorax* dull black and distinctly punctate throughout, with the pronotum somewhat broadly ochreous; notauli and sternauli entirely wanting; metathorax granulose and shortly pilose, with an obsolete longitudinal discal sulcus; petiolar area very short, and distinctly carinate basally; spiracles small and circular, apophyses

Fig. 64.—*Fintona nigripalpis*, Cam.

wanting. *Scutellum* black, punctate, somewhat nitidulous, convex and simple. *Abdomen* dull red, with the basal segment entirely and the anus black, elongate-fusiform, with the first three segments distinctly punctate; basal segment irregularly scabriculous, twice as long as apically broad, subelevated discally near its base and laterally straight, with the spiracles before its centre; the three following segments slightly elevated apically; anus glabrous and subcompressed, with the hypopygium extending to the apex but not produced; terebra shorter than the basal segment, with the stout spicula fulvous and the valvulæ black. *Legs* slender and somewhat elongate, dull red, with all the coxæ and trochanters, posterior tarsi, hind tibiæ and apices of their femora, black; tarsi distinctly pectinate beneath, calcaria of unequal length. *Wings* hyaline and not broad; stigma black, tegulæ piceous; areolet triangular and not small, emitting the broadly fenestrate second recurrent nervure a little before its centre; internal cubital somewhat sharply curved with no nervelet; nervellus distinctly postfurcal and intercepted below its centre.

Length 9 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

Described from the unique type specimen.

Genus **EPONITES**, *Cam.*

Eponites, Cameron, Zeits. Hym.-Dip. 1905, p. 77.

GENOTYPE, *E. ruficornis*, Cam.

Frons broadly and deeply impressed transversely below the widely separated ocelli to outer side of scrobes, and centrally longitudinally sulcate between two compressed obtuse and flabellate horns just above and within the scrobes; eyes internally emarginate; clypeus strongly transverse, basally curved, apically truncate; ligula short and spiniform; mandibles stout and parallel-sided, with the much larger upper tooth obliquely truncate and the subobsolete lower one obtuse. Scape subcircular; flagellum stout, in ♀ hardly longer than the head and thorax and in ♂ shorter than the body; basal joint hardly twice as long as broad, the remainder rapidly becoming transverse. Thorax stout and convex, but little longer than high; mesonotum distinctly punctate, with no notauli; metathorax very short and low, though hardly narrower than mesothorax, evenly and somewhat deeply punctate, with all the costæ wanting and the spiracles linear. Scutellum large, simple and flavous; postscutellum sometimes obsolete. Abdomen as in *Banchus*. Hind legs of normal length and distinctly stout, with the tarsi somewhat short and their claws obsoletely pectinate basally. Wings a little clouded, normal; areolet large, not rhomboidal, triangular and internally produced; upper basal emitted from the median nervure distinctly before the lower basal; nervellus emitted from the strongly postfurcal first

recurrent of lower wings immediately below its junction with the median.

Range. Northern India.

In its superficial outline, black and flavous coloration, disposition of the alar neuration (except its areolet) and the shape of its abdomen, this genus strongly resembles *Banchoides græca*, Kriech., and is undoubtedly very closely related thereto, especially in the short and low metathorax, incrassate hind legs (resembling those of *Catoglyptus*) and, especially, the broadly triangular areolet (somewhat resembling that of *Metopius*); but the very peculiar frontal impressions, lamellate horns and obliquely truncate mandibles will render it abundantly distinct. Its author (*loc. cit.*) places it in the TRYPHONINI and suggests no further affinities; but subsequently (Journ. Bombay Nat. Hist. Soc. 1906, p. 291) says "I am not certain as to its exact systematic position. Nor am I certain if it will fit into any of the established tribes. I believe its true position is in the BANCHINI"; wherein he is undoubtedly correct, as I have shown above.

Table of Species.

1 (2)	Scutellum not transverse; postscutellum distinct	*ruficornis*, Cam.
2 (1)	Scutellum transverse; postscutellum obsolete . .	*scutellaris*, sp. n.

182. Eponites ruficornis, *Cam.*

Eponites ruficornis, Cameron,* Zeits. Hym.-Dip. 1905, p. 77 (♀); id., Journ. Bombay Nat. Soc. 1906, p. 291 (♂).

♂ ♀. *Head* shortly parallel-sided behind the hardly prominent eyes; black, with the external orbits broadly (often nearly coalescing behind ocelli), the frontal orbits (sometimes extending as far as the apical ocellus), face, clypeus, mandibles (except at apices), and the palpi, flavous. *Antennæ* (in type form) entirely fulvous, with scape above black and beneath flavous; but flagellum usually infuscate-ferruginous; of ♂ more elongate. *Thorax* black, with an anteriorly subhamate line extending to above radices, a mark below it in front, a long callosity beneath and sometimes a small one before, radices, a transverse mark on mesopleuræ, and the metathorax except at base and extreme apex (and in type form longitudinally above the hind coxæ), flavous. *Scutellum* flavous,

Fig. 65.—*Eponites ruficornis*, Cam.

sparsely and distinctly punctate, not or hardly broader than long, with the postscutellum always very distinct and flavous throughout. *Abdomen* fusiform, nitidulous, finely pubescent and very obsoletely punctate; flavous, with the basal half of the first four or five segments black (type form with basal segment only centrally flavous at its apex); basal segment little narrowed basally, unimpressed, with spiracles distinctly before its centre; anus compressed; terebra and male valvulæ fulvidous, stout and subexserted. *Legs* flavous, with extreme base of anterior, and underside of hind, coxæ black; anterior femora lined beneath, the intermediate above, their trochanters above, basal half of hind trochanters, and their femora except below, black; hind tarsi and apical half of their tibiæ, as well as the unequal calcaria, red; front calcaria strongly curved. *Wings* with a rosy reflection, and a little infumate towards their apices; radix and front of tegulæ flavidous; costa and stigma fulvous, nervures a little darker.

Length 8½–10½ millim.

KASHMIR, 5000–6000 ft., v. 01 (*Col. Nurse*, type); SIKKIM: Darjiling; BENGAL: Pusa, i.–iii. 1905 and 1906 (Pusa coll.).

Type ♀ in Col. Nurse's collection.

Col. Nurse has kindly allowed me to describe the typical female of this species. I have also examined two males and two females from Pusa which are apparently referable to the same species, though a little larger in size, with darker antennæ and the hind femora discally pale.

183. **Eponites scutellaris**, sp. n.

♀. A black and flavous species, with the wings a little clouded, the scutellum distinctly transverse and large, and the postscutellum represented by a flavous callosity on either side.

Length 10 millim.

BENGAL: Pusa, iii. 06.

Type in the Pusa collection.

This insect so closely resembles *E. ruficornis* as to need no detailed description; it may be instantly recognised from it by its larger and very much broader scutellum; by the postscutellum being centrally obsolete and represented only by a transverse pale callosity on either side.

The only specimen I have seen was captured on Juar millet (*Andropogon*).

Subfamily TRYPHONINÆ.

The peculiar scarcity of the Tryphoninæ in India is very remarkable and is but partially accounted for by the restriction of sawflies to the hill districts. That the latter are probably entirely confined to the mountains I am assured by Mr. Rowland Turner, who found them very commonly on the top of the Khasi Hills, about Shillong, at an altitude of 6000 feet, and has presented his collection thence to the British Museum; while the Rev. F. D. Morice informs me that they are generally scarce throughout all tropical countries. Respecting those of India but little is at present known, though Cameron has described a few and Konow brought forward others from Sikkim (Zeits. Hym.-Dip. 1908, p. 19 *et* Entomologist, 1907, p. 3; &c.). The former is undoubtedly correct when he says (Manch. Mem. 1900, p. 104) that "the Tryphonides are very numerous in the northern parts of the Palæarctic and probably also of the Nearctic zoological regions, but are little known outside them. A large number are known to be parasites on Tenthredinidæ"; the only unfortunate circumstance, in this case, is that the species he ascribes to the present subfamily proved upon my examination of the types to be referable to the Pimplinæ. Nevertheless, scarcity of sawflies only accounts for a corresponding diminution in the numbers of the Tryphonides, since the remaining tribes prey upon Lepidoptera, Diptera, &c., of which there is no lack.

Dalla Torre's Catalogue of 1901 enumerates but six Indian species of this subfamily, all described as new by Cameron during the years 1897–1900; and the latter subsequently brought forward some twenty-five more, mainly well-known European forms under new names, which I have had the opportunity of examining in Col. Nurse's collection. Of these thirty-one, I believe twenty-seven to be good species, I have recognised fourteen as described by Continental authors, and I have discovered eighteen, which do not appear to have hitherto been noticed, giving a total of sixty kinds, which would appear very meagre when compared with the four hundred species found in the British Isles.

The Tryphoninæ are for the most part very easily recognised by their sessile abdomen, concealed terebra and deplanate body. The typical tribe of the Tryphonides, however, is liable to confusion with those Cryptinæ which have the outer nervure of the areolet wanting, and the males are at present very indifferently separated from those of the Lissonotides (Pimplinæ), since no good characters of discrimination have yet been enunciated. The remaining tribes, nevertheless, are abundantly distinct from all other Ichneumonidæ: the Metopiides by their square scutellum and scutiform face, the Sphinctides in the conformation of their areolet and abdomen, and the Bassides in their tridentate mandibles.

Table of Tribes.

1 (2)	Scutellum quadrate, apically produced; face scutate	*METOPIIDES*, p. 262.
2 (1)	Scutellum triangular, not produced; face not scutate.	
3 (4)	Abdomen strongly fusiform and elongately petiolate	*SPHINCTIDES*, p. 272.
4 (3)	Abdomen not strongly fusiform, usually sessile.	
5 (6)	Upper mandibular teeth apically bifid	*BASSIDES*, p. 274.
6 (5)	Upper mandibular teeth entire.	
7 (8)	Face very strongly protuberant; body convex	*EXOCHIDES*, p. 289.
8 (7)	Face normal; body deplanate or but slightly convex	*TRYPHONIDES*, p. 311.

It may perhaps be of use in the case of bred specimens to add a table of the hosts to which the above tribes are generally supposed to be more or less exclusively attached:—

METOPIIDES are usually parasitic upon BOMBYCIDÆ (Lepidoptera).
SPHINCTIDES are usually parasitic upon COCHLIOPODIDÆ (Lepidoptera).
BASSIDES are usually parasitic upon SYRPHIDÆ (Diptera).
EXOCHIDES are usually parasitic upon TORTRICIDÆ (Lepidoptera).
TRYPHONIDES are usually parasitic upon TENTHREDINIDÆ (Hymenoptera).

Tribe *METOPIIDES*.

The tribe METOPIIDES was divided from the remainder of the TRYPHONINÆ by Holmgren under the name TRYPHONIDES-ASPIDOPI (Sv. Ak. Handl. 1855, p. 98) on account of the apically truncate scutellum, the apical angles of which are produced, but this characteristic is lacking in one of our Indian genera, which was, nevertheless, included here by Dalla Torre in 1901, doubtless on the strength of its author's remarks, quoted below. Upon these we must for the present rely, since he further gives us the bare details that in one species the petiole is "very smooth and shining" and, in the other, part of the petiole and the two apical segments are "thickly covered with pale hair"; and this but poorly represents the very distinctive sculpture of the typical genus *Metopius*, Panz. (*q. v. post*).

Table of Genera.

1 (2)	Scutellum apically constricted; abdomen basally subpetiolate	SCALLAMA, Cam., [p. 263.
2 (1)	Scutellum quadrate; abdomen not basally constricted.	
3 (4)	Antennæ filiform; abdomen parallel-sided.	METOPIUS, Panz., [p. 265.
4 (3)	Antennæ subclavate; abdomen fusiform ..	CULTRARIUS, Davis, [p. 270.

Genus SCALLAMA, *Cam.*

Scallama, Cameron, Manch. Mem. 1899, p. 216.

GENOTYPE, *S. trilineata*, Cam.

Head distinctly contracted behind the large and internally strongly emarginate eyes; cheeks distinct, clypeus not discrete; mandibles with a single somewhat elongate apical tooth palpi short and incrassate. Antennæ short and stout, with the third joint elongate and nearly double length of the fourth. Thorax with notauli wanting; mesopleuræ distinctly prominent centrally, with an oblique slope at both base and apex; metathorax with lateral carinæ only; spiracles oblique, elongate and rounded at both extremities. Scutellum deplanate, laterally immarginate and apically gradually constricted; postscutellum large, glabrous, deplanate and apically depressed. Petiole basally dilated, becoming gradually broader throughout to apex, with the spiracles small, circular and subbasal; remaining segments deplanate. Legs short and incrassate, with the femora inflated; posterior tibiæ bicalcarate, hind calcaria large, with the exterior calcar lanceolate, slightly curved and much the longer; hind tarsi densely setulose, their claws large, basally incrassate and apically acuminate. Areolet wanting or small, oblique and not longer than its petiole, emitting the second recurrent nervure shortly beyond its centre; basal nervure not continuous.

Range. Assam.

Its author says (*loc. cit.*) that this genus "comes near *Metopius* and *Bassus* in some respects—in the thickened legs for instance—but differs from them in the abdomen not being so broad at the base. Its characteristics are the thickened legs, the mesothorax dilated in the middle, the large flat scutellum, and the distinctly petiolated areolet. The genus contains two sections. One represented by *S. trilineata*, having a distinct appendiculated areolet, and a keel outside the metapleural spiracles; the other represented by *S. crassipes*, having no areolet and a keel on the outer and inner side of the spiracles. Unfortunately I have no females, both the species being represented by males."

I have seen both types of this genus and find it to be intermediate between the present tribe and the EXOCHIDES.

Table of Species.

1 (2) Mesopleuræ punctate: areolet distinct; thorax partly red .... *trilineata*, Cam.
2 (1) Mesopleuræ impunctate; areolet obsolete; thorax black .... *crassipes*, Cam.

184. Scallama trilineata, *Cam.*

Scallama trilineata, Cameron,* Manch. Mem. 1899, p. 217 (♂).

♂. A fulvous species with black markings and the areolet entire.

Head black with the clypeus testaceous, the mandibles (except apically) and palpi flavous; face strongly and evenly punctate, with dense long white pilosity; frons and vertex superficially punctate, with dense long brown pilosity, longer behind ocelli, which are preceded by a triangular impression. *Antennæ* stout and fulvescent; scape pilose, and flavescent beneath; flagellum densely black pubescent, becoming slightly incrassate apically. *Thorax* with propleuræ nitidulous, black and broadly rufescent above; mesonotum nitidulous and with short white hairs, ferruginous, with a broad central longitudinal stripe and the apices of the lateral lobes black; mesopleuræ obscurely punctate, with long white pilosity, black, with a central red fascia; metanotum evenly convex throughout, smooth and nitidulous, with long white hairs, basally blackish and deeply impressed in the centre of both base and apex. *Scutellum* glabrous and nitidulous, with dense and long infuscate pilosity, basally black and deeply impressed. *Abdomen* above and below fulvescent, with the very smooth and shining first segment (except apically), the second entirely, the third (except laterally), and more or less of the remainder, black. *Legs* short and stout, with the basally black femora incrassate; the tibiæ and tarsi stout, with the anterior flavescent, hind ones dark red and the posterior apically black; calcaria rufescent, hind tarsi and apices of their claws black. *Wings* more or less distinctly fulvescent-hyaline, with the costa and nervures paler, and the stigma red.

Fig. 66.—*Scallama trilineata*, Cam.

Length 11–12 millim.

The extent of nigrescence varies throughout, as does the density of alar fulvescence.

ASSAM: Khasi Hills (*G. A. J. Rothney*).

Type in the Oxford Museum.

I have seen an insect in the British Museum labelled "*Scallama fortipes*, Cam.; type: Khasia." The latter I presume to be a manuscript name, since I can find no mention of it in the literature; the specimen agrees with the above description fairly accurately.

185. Scallama crassipes, *Cam.*

Scallama crassipes, Cameron,* Manch. Mem. 1899, p. 219 (♂).

♂. Larger than the preceding, with the thorax immaculate black and the areolet wanting. *Head* black; the strongly punctate face with dense and elongate fulvous, occiput with shorter black, pilosity. *Antennæ* densely and very shortly pilose, rufescent,

becoming slightly darker apically. *Thorax* nitidulous, with the pleuræ impunctate; mesonotum with dense infuscate hairs; metapleuræ with long pale hairs. *Scutellum* and postscutellum rufescent, the former with fulvous pubescence. *Abdomen* dark red, with the basal two-thirds of the petiole, and the two apical segments, black and with dense pale hairs. *Legs* red, with all the coxæ, trochanters and the hind femora black; tarsi, apical half of the hind tibiæ, and their femora laterally, blackish. *Wings* with violaceous tinge; tegulæ rufescent; costa, stigma and nervures dark testaceous; areolet entirely wanting.

Length 13–14 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

"A larger species than *S. trilineata*, from which it may be known by the pleuræ, meso- and meta-notum being entirely black, and by the absence of the areolet"; the wings also are darker and the mesopleuræ impunctate.

Genus **METOPIUS**, *Panz.*

Metopius, Panzer, Krit. Revis. ii, 1806, p. 78.
Peltastes, Illiger, Rossi, Fauna Etrusca, 1807, p. 55.

GENOTYPE, *Ichneumon micratorius*, F.

Head not large, transverse and usually with flavous markings anteriorly; face prominent above, centrally concave, with the margin elevated throughout or obsolete below; mandibles apically entire or emarginate; maxillary palpi with the second joint incrassate. Antennæ somewhat stout and subattenuate at both extremities, usually more or less rufescent, especially beneath. Thorax stout, dull and often with small flavous marks. Scutellum quadrate, apically broadly truncate and often flavous, with the lateral margins elevated and the apical angles subspinously produced. Abdomen sessile, subcylindrical, strongly and rugosely punctate, black, most of the segments having flavous margins and the first very short; seventh segment of ♂ half the length of the sixth, of ♀ very short and hardly exserted; terebra hidden. Hind femora incrassate and often subfusiform; intermediate tibiæ unicalcarate. Wings flavescent and not broad, with their apices sometimes infumate; areolet large and transverse-quadrangular. Size large.

Range. World-wide.

The species of this genus are connected with the BASSIDES in the apically bifid upper tooth of the larger species and the roughly sculptured abdomen, though they materially differ in the total lack of a lower tooth, as well as in the unique conformation of the face, scutellum and areolet. The superiorly produced face and subincrassate hind femora ally them with the EXOCHIDES.

It is strange that so strikingly large and handsome species as are

those of this genus should have received such scant attention, and one can but presume that they are sufficiently uncommon everywhere to have escaped special study. The only detailed observations I have seen are those of M. Doumerc upon *Ichneumon fasciatus*, Fourc. (Ann. Soc. France, 1860, p. 319), who bred it from a moth, *Saturnia carpini*. The genus preys so certainly upon Lepidoptera that we are justified in regarding the two doubtful records of it from Tenthredinidæ, instanced by Van Vollenhoven, as almost certainly erroneous.

Table of Species.

1 (2)	Mandibles bidentate; wings anteriorly entirely infumate	*lar*, Morl., p. 266.
2 (1)	Mandibles unidentate; wings at most apically infumate.	
3 (6)	Black and yellow; face sparsely punctate; areola entire.	
4 (5)	Abdomen cylindrical; thorax elongate; facial shield distinct	*pulchripes*, Cam., [p. 267.
5 (4)	Abdomen fusiform; thorax short; facial shield obsolete	*fusiformis*, sp. n., [p. 268.
6 (3)	Red, black and yellow; face closely punctate; areola obsolete	*rufus*, Cam., p. 269.

186. **Metopius lar**, *Morl.*

Metopius lar, Morley, Revis. Ichn. Brit. Mus. 1912, p. 81 (♂ ♀).

♂ ♀. An elongate black species, with the legs and segmental apices dull red, and the costa infumate. *Head* black, with all the margins of the facial shield, the juxta-antennal orbits and a triangular mark between the scrobes, ochraceous; occiput abruptly declivous, frons coarsely and evenly punctate, eyes emarginate, cheeks short; facial shield evenly punctate and strongly margined throughout, basally truncate and apically rounded; clypeus coarsely punctate, subtriangular and truncately discrete basally; mandibles not broad, bidentate, with the lower tooth subinternal and much the shorter; second joint of maxillary palpi strongly incrassate, inflated and emitting the small remainder slightly before its apex; mouth strongly margined below. *Thorax* immaculate and closely punctate, with the mesonotum obsoletely impressed discally and with

Fig. 67.—*Metopius lar*, Morl.

white pilosity throughout; metathorax coarsely punctate, with the areæ entire and strong; areola cordiform, basally truncate and extending to centre, enclosing a carina and emitting costulæ from its centre; apophyses distinct and obtuse; mesopleural sulcus straight and deeply impressed. *Scutellum* black and quadrate, apically depressed in the centre, with its angles acuminately produced; postscutellum small and with long hairs. *Abdomen* cylindrical and broadest towards apex, half as long again as head and thorax, very coarsely and (towards the base) confluently punctate, black, with the apices of all the segments dull red; basal segment almost broader than long, with two parallel carinæ on the disc; the three following with one discal carina, their apical angles a little elevated; the remainder basally carinate and purplish; terebra not exserted, hypopygium of ♀ large and reaching apex. *Legs* dull red, with the coxæ and trochanters, as well as at least the hind tibiæ and tarsi, black; all the calcaria white, the front ones like the base of their tarsi strongly sinuate. *Wings* narrow and a little clouded throughout, with the costa of the anterior pair deeply and broadly piceous; radix and tegulæ black; areolet broader than high, distinctly sessile, fenestrate below the centre of its external nervure, and emitting the straight and unifenestrate second recurrent nervure distinctly beyond its centre; nervellus postfurcal and intercepted at its upper third.

Length 17 millim.

SIKKIM: Gantok, vi. 03 (*H. J. Walton*).

Type in the British Museum.

The above description is drawn from three specimens, representing both sexes of this very distinct species.

187. **Metopius pulchripes**, *Cam.*

Metopius pulchripes, Cameron,* Journ. Bombay Nat. Hist. Soc. 1907, p. 586 (♀, as ♂).

♀. A black and flavous species, with the hind legs, except at their base, red. *Head* closely punctate and black, with the prominent eyes internally parallel; vertical orbits, face, cheeks, the whole mouth (except the basal margin) and apices of the unidentate mandibles, flavous; face deplanate, shining, distinctly and sparsely punctate, strongly circumcarinate and apically connected with the discrete and triangular clypeus. *Antennæ* ferruginous, with the scape flavous, and flagellum fulvous, beneath. *Thorax* not broad, coarsely and irregularly punctate and pilose, black, with elongate callosities before and beneath radices, coalescent with a perpendicular mesopleural fascia, and a dot on either side of metanotum, flavous; areola alone entire, subcordiform. *Scutellum* quadrate, deplanate, strongly and sparsely punctate, laterally carinate throughout, black, with its apex entirely, the produced apical angles, laterally dentate basal angles and postscutellum,

flavous. *Abdomen* cylindrical, broadest behind the centre, with the apical angles of the second and third segments subproduced; basal segment not longer than broad, apically truncate and subglabrous, its spiracles basal; following segments strongly and longitudinally punctate, becoming more finely sculptured apically; apices of four first segments broadly, of the remainder narrowly, flavous above and below; terebra and the distinct ventral plica flavous. *Legs* flavous; hind coxæ piceous, with their stout femora, tibiæ and tarsi red. *Wings* not large, with their apices somewhat distinctly infumate; tegulæ piceous; radix, costa and stigma ferruginous; areolet transverse and somewhat distinctly petiolate, fenestrate above before its apex; nervellus postfurcal and intercepted very far above its centre.

Length 12 millim.

Assam: Khasi Hills, 1000–3000 ft., iii. 07 (Pusa coll.); Rajputana: Mt. Abu (*Col. Nurse*, type); Bombay: Poona, viii. 86 (*R. C. Wroughton*); Madras: Bangalore (Ind. Mus.).

Type in Col. Nurse's collection.

The above description is drawn from the typical female.

188. **Metopius fusiformis**, sp. n.

♀. A pretty black and flavous species, with basally subattenuate antennæ and fusiform abdomen. *Head* strongly transverse and very narrow behind the eyes; black, with the strong interantennal horn and whole face, but not the undiscrete clypeus, flavous. *Antennæ* as long as the body, somewhat stout and distinctly a little attenuate basally, black, with the basal scapal joint entirely flavous. *Thorax* short and subspherical, convex, densely and closely punctate, with only the strong callosities beneath the radices flavous; metathorax subnitidulous, very short, but not abruptly declivous; petiolar area entire and basally strong throughout; areola half as long again as broad, subrectangular, emitting strong costulæ from its centre; spiracles oval and prominent. *Scutellum* transverse, strongly convex, flavous, with its lateral extremities cornutely produced; postscutellum triangular, flavous. *Abdomen* very strongly convex, dull and closely punctate, fusiform and resembling that of *Sphinctus*; black, with the apical half of the three discally bicarinate basal segments laterally and apices of the following broadly, flavous; first segment a little longer than broad and parallel-sided, with its base abruptly constricted; anus very strongly obtuse and extending beyond the acuminate spicula. *Legs* not elongate or slender; flavous, with the posterior coxæ (except apices of the intermediate), their femora, apices of the hind tibiæ with their tarsi, black. *Wings* hyaline; radix and tegulæ ochraceous, stigma piceous; areolet exactly triangular and somewhat broadly sessile, emitting re-

current nervure before its centre; basal nervure subcontinuous through the median; nervellus opposite, geniculate and interrupted slightly below its centre.

Length 9 millim.

BURMA: Karen Hills, 3000–3700 ft. (*L. Fea*).

Type in the Genoa Museum.

This species appears to constitute a connecting link between *Metopius* and *Cultrarius*, having the antennæ not altogether filiform, the thorax subsphærical and the abdomen fusiform; nor is the facial shield by any means distinct. Described from a single female.

189. Metopius rufus, *Cam.*

Metopius rufus, Cameron,* Zeits. Hym.-Dip. 1905, p. 281 (♀).

♀. A rufescent species, with the abdomen black and yellow. *Head* with white pilosity; the closely punctate and circumcarinate face and the palpi flavescent; clypeus and labrum rufescent, more strongly punctate than the face and with close white pilosity, mandibles unidentate and rufescent, with a pale basal mark; frons and vertex closely punctate, ocellar region black, frontal orbits flavous and frons carinate. *Antennæ* rufescent. *Thorax* with white hairs; pro- and mesonotum closely and distinctly punctate, more coarsely at the base; pleuræ closely punctate, mesopleuræ with a broad and superficial sulcus; metanotum with the areola laterally indicated but apically wanting, its carinæ convergent; metapleuræ nitidulous and sparsely punctate. *Scutellum* laterally straight; its smooth apical half, and the post-scutellum, flavous; basal depression black and strongly tricarinate. *Abdomen* subcylindrical, with the fifth segment broadest, piceous black; four basal segments coarsely and longitudinally punctate, with at least their apical half flavous; basal segment subtransverse and nitidulous, with spiracles at its black base; anus entirely piceous; terebra small, acuminate and extending to apex. *Legs* unicolorous red, with dense but obsolete white pubescence. *Wings* hyaline, with the tegulæ, costa and stigma red; areolet strongly transverse, distinctly petiolate and minutely fenestrate above its apex; apex of wing with a large and subdeterminate infumate spot.

Fig. 68.—*Metopius rufus*, Cam.

Length 12 millim.

RAJPUTANA: Mt. Abu (*Col. Nurse*); BOMBAY: Poona (*R. C.*

Wroughton); MADRAS: Bangalore (Ind. Mus.); BURMA: Bhamo (*L. Fea*). HONG-KONG (Brit. Mus.).

Type in Col. Nurse's collection.

This species is readily recognised by its rufescent head, thorax and legs, as well as by the conspicuous apical alar mark; its author remarks that the thorax is more elongate, especially in front of the tegulæ, than it is in the European species.

Genus **CULTRARIUS**, *Davis.*

Cultrarius, Davis, Trans. Amer. Ent. Soc. 1897, p. 197.

GENOTYPE, *Metopius rileyi*, Marlatt.

Head somewhat small, much narrower and discally lower than the thorax; second joint of maxillary palpi not strongly incrassate. Antennæ basally constricted and apically "strongly subclavate." Thorax subspherical, on account of the broad meso- and short pro- and meta-thoraces: metathorax depressed and flat "to fit the basal segment of the abdomen; without distinct areolet." Basal abdominal segment short and wedge-shaped, with the front upper portion broad, deplanate and subconcave; ovipositor large, geniculate, and longer than the body.

Range. United States, Sikkim.

This genus is said to agree with *Metopius* in having a distinct facial shield and the intermediate tibiæ unicalcarate; but to differ in its small head, wedge-shaped and discally flat basal segment, and in the large, elongate, and geniculate tenebra. The head is much narrower than the thorax, the antennæ apically incrassate, the abdomen fusiform and apically attenuate, and the nervellus of the hind wing geniculate above its centre. It was founded upon a North American species from Kansas and Dakota. Cameron has described three Indian males, which are quite unknown to me.

Table of Species.

1 (2) Wings entirely infumate; abdomen with flavous markings....................	*flavobalteatus*, Cam., [p. 270.
2 (1) Wings only apically infumate; abdomen with red markings.	
3 (4) Areola elongate; scutellum black	*purpureotinctus*, Cam., [p. 271.
4 (3) Areola transverse; scutellum with flavous markings	*areolatus*, Cam., p. 272.

190. **Cultrarius flavobalteatus**, *Cam.*

Cultrarius flavobalteatus, Cameron, Zeits. Hym.-Dip. 1903, p. 342 (♂).

♂. A black species, with the abdomen banded with violaceous and flavous, and the wings infuscate. *Head* with clypeus flavous-margined and closely punctate, apically broadly rounded and depressed, laterally broadly margined and, like its base, flavous;

facial orbits flavous, constricted above; frons and vertex glabrous and nitidulous. *Antennæ* black, piceous beneath. *Thorax* black, with small callosities below radices flavous; mesonotum closely and evenly punctate; metapleuræ deplanate, smooth and nitidulous; petiolar area strongly trans-striate, remainder irregularly and coarsely reticulate; propleuræ nitidulous and irregularly striate, closely rugose above and apically; mesopleuræ closely and rugosely punctate, apically smooth and shining, with their sulci broad and deeply impressed. *Scutellum* subrugosely punctate, laterally elevated and apically shortly produced on either side; the apex flavous, perpendicularly depressed and centrally carinate; the basal impression transverse, with six stout longitudinal carinæ, the lateral ones flavous. *Abdomen* purplish; basal segment centrally elevated and with two flavous carinæ, apically broadly flavous; second segment with an apical flavous mark on either side; the three following segments apically flavous, the sixth elevated and apically subprominent, and the seventh small and obliquely constricted towards its apex. *Legs* black, with white pilosity; apical half of front femora, the tibiæ, and the tarsi pale red; the front calcaria pale red, the intermediate white, and the hind ones black. *Wings* violaceo-infumate, with the base and apex of their tegulæ broadly flavous.

Length $12\frac{1}{2}$ millim.

SIKKIM: Darjiling.

Cameron tells us (*loc. cit.*) that the antennæ of the only specimen he had seen were broken off before their centre.

191. Cultrarius purpureotinctus, *Cam.*

Cultrarius purpureotinctus, Cameron, Ann. Nat. Hist. xix, 1907, p. 176 (♂).

♂. A black species, the head with flavous markings and the wings apically infumate. *Head* with somewhat strong but not very close punctation, that of the clypeus and apex of face distinctly stronger and closer; facial carinæ laterally and more narrowly above, and lower frontal orbits flavous; occiput glabrous and with dense white hairs. *Antennæ* with the flagellum piceous, and the scape flavous, beneath. *Thorax*: pro- and meso-thorax strongly and closely punctate, with their pleuræ more coarsely so; mesopleural sulci broad and deeply impressed; areola shagreened and hexagonal, distinctly longer than basally broad, with its apical half constricted and the truncate apex but half the width of the base, whence a central carina extends longitudinally throughout its disc; lateral areæ broader than long, apically broadly rounded and substriate, with a few large central punctures; petiolar area closely and rugosely punctate; metapleuræ strongly and coarsely punctate. *Scutellum* very strongly and evenly punctate, its basal impression broad, deep, and with five carinæ; its apical declivity apically aciculate, lateral teeth large and triangular; postscutellum with dense long white hairs. *Abdomen* closely and densely punc-

tate; basal segment centrally elevated and bicarinate; second and fifth segments obsoletely, third and fourth more distinctly, carinate discally; lateral marks on first and fourth segments, apices of second and third, ferruginous: anus distinctly purplish and with short black hairs. *Legs* black; anterior tibiæ and tarsi below, and the hind femora, red; calcaria white, with the front ones testaceous. *Wings* hyaline and strongly iridescent, with the radial cell and apical half of the external cubital infumate; areolet large, emitting the second recurrent nervure from its centre, with its sides not coalescent above.

Length 14 millim.

SIKKIM: Takvar, Darjiling, 4000 ft. (*Col. Bingham*).

192. **Cultrarius areolatus**, *Cam.*

Cultrarius areolatus, Cameron, Ann. Nat. Hist. xix, 1907, p. 177 (♀).

♀. A black species, the head and scutellum with flavous markings, and the wings apically infumate.

Length 10 millim.

SIKKIM.

This species is said by its author to resemble *C. purpureotinctus* so closely as to need no detailed description. Therefrom it may at once be known by the metanotal areola not being longer than broad, gently and evenly rounded to the subcircular and not truncate apex; the lateral areæ not punctate; the scutellum partly flavous and centrally deeply sulcate; the petiolar carinæ apically curved and coalescent, not parallel; the areolet shortly petiolate above and the hind femora black. Cameron adds (*loc. cit.* p. 178) that "the coloration is the same otherwise, except that the purple tint on the abdomen commences on the second segment, that the scutellar keels are yellow, and that the lines on the second to fifth abdominal segments are narrower, of more uniform thickness, and more yellowish in colour. The puncturation is pretty much the same; on the second segment of the abdomen it is stronger and more irregular, that segment, too, being shorter compared with the width; the keels on the second to fourth segments are narrow, but distinct. The calcaria are all whitish. The abdomen is shorter, too, compared with the thorax."

Tribe *SPHINCTIDES*.

Face deplanate; antennæ stout and filiform. Metathorax short, subvertical, with the areola obsolete or strongly transverse, and the petiolar area very large; spiracles minute and circular. Scutellum large, deplanate, strongly margined and sometimes hardly separated from the mesonotum. Abdomen dull and strongly punctate, elongately petiolate with prominent spiracles in centre of basal segment; second segment not discally carinate. Legs slender; hind tibiæ unicalcarate, the intermediate bicalcarate. Areolet sessile, triangular and not large, its inner nervure oblique

and the outer continuous with the straight recurrent nervure; submedian longer than the median cell; nervellus subopposite and intercepted but very slightly below its centre.

This tribe is abundantly distinct in the peculiar conformation of its areolet, the strongly petiolate abdomen, margined scutellum, subvertical metathorax, and tibial calcaria. But one genus, containing two species, has hitherto been described.

Genus **SPHINCTUS**, *Grav.*

Sphinctus, Gravenhorst, Ichn. Eur. ii, 1829, p. 363.
Eradha, Cameron, Manch. Mem. 1899, p. 213.

Genotype, *S. serotinus*, Grav.

The characters are those of the tribe. The only previously described species, *Sphinctus serotinus*, Grav., was found by Ratzeburg in 1848 (Ichn. d. Forst. ii. p. 119) to attack the larvæ of a moth, *Limacodes testudo*, Schiff. Cameron is undoubtedly correct when he says (*loc. cit.*) that "it is very distinct from either *Trogus* or *Amblyteles*," though his assertion that "it belongs to the section Amblypygi of Wesmael" is open to doubt, especially when admitted to be founded on "the fact of there being no longitudinal fold on the ventral surface of the abdomen in the ♂," since the only sex he knew was the female, as shown by his type in the British Museum, received in 1899.

Range. England, Central Europe, Assam.

193. **Sphinctus trichiosoma**, *Cam.* (Plate I, fig. 8.)

Eradha trichiosoma, Cameron,* Manch. Mem. 1899, p. 214 (♀, as ♂).

♀. A black and pilose species, with the abdomen centrally red and the legs partly pale. *Head* as broad as the thorax, not narrowed behind the eyes, black and pilose, with the external orbits very narrowly, and the facial orbits triangularly to above the obsolete scrobes, stramineous; frons and face dull, the latter slightly convex centrally and hardly discrete from the clypeus, which is strongly biemarginate and centrally acuminate at its apex; palpi and the obtusely bidentate mandibles black. *Antennæ* much shorter than the body, stout, slightly attenuate apically and entirely black. *Thorax* black and gibbous; mesonotum coriaceously punctate and convex, with no notauli; mesopleuræ nitidulous and apically punctate; meta-

Fig. 60.—*Sphinctus trichiosoma*, Cam.

thorax very short, with long hairs; areola strongly transverse, petiolar area large and carinate throughout, apophyses conspicuous. *Scutellum* strongly deplanate, scabrously punctate and subquadrate, with the apical angles rounded; its base hardly discrete from the mesonotum, its sides with long hairs and strongly bordered to the apex which is, like that of the postscutellum, red. *Abdomen* obconical, dilated from base to apex, with white hairs and densely punctate, black, with the apex of the first, whole of second and (excepting two basal dots) of the third segment, brick-red; basal segment coarsely punctate, petiolate to the prominent central spiracles and thence parallel-sided to apex; venter black, with incisures flavescent; hypopygium broadly rounded and covering base of the stout but hardly exserted terebra. *Legs* black, shining and slender; tibiæ and tarsi white, with the apical two-thirds of the hind tibiæ, whole of their tarsi, and apical three joints of the anterior pairs, black; claws small and strongly pectinate. *Wings* distinctly infumate and somewhat ample; radix, tegulæ, and stigma infuscate; nervures conspicuous.

Length 16 millim.

ASSAM: Shillong, 6000 ft., ix. 03 (*Rowland Turner*).

Type in the British Museum.

I have seen three females only.

Tribe *BASSIDES*.

This tribe appears to be very closely related to the PIMPLINÆ in its sessile and often coarsely sculptured abdomen, which is, in the typical forms, very distinctly impressed in the same manner, though transversely and not obliquely, as in the case of *Glypta* and many *Pimpla*. It forms, however, an entirely homogeneous group, at once distinguished from all other TRYPHONINÆ by its normal scutellum and apically bifid upper mandibular teeth; the peculiar conformation of the strongly deplanate and sessile basal segment is also distinctive, and the general facies is so peculiar that, with a very little experience, it may be recognised at a glance.

Bassus formed Gravenhorst's eighth group and was divided by him from *Metopius* and the PIMPLINÆ with convex abdomen on account of its deplanate abdomen, with the basal segment flat and parallel-sided; in it he placed the genera *Euceros*, *Orthocentrus*, and *Bassus*, of which the last two have the antennæ not centrally incrassate, and the latter differs from *Orthocentrus* in its obviously more slender legs; from the remainder of the TRYPHONINÆ these three genera were said to differ in the entirely sessile abdomen. In 1855 Holmgren discovered that in Gravenhorst's restricted genus the upper mandibular tooth was apically cleft, while in all other Tryphonids, except certain *Metopius*, it is entire; hence he erected a group for the sole reception of this genus under the name TRYPHONIDES SCHIZODONTI. Desvignes, who in 1862 described

eleven species, considered by him to have been unknown to Gravenhorst, was unacquainted with Holmgren's work. In 1868 Förster brought forward his numerous genera and divided *Bassus* into ten, giving the most meagre and often trivial characters, with no indication of types; these "genera" are unfortunately being nowadays largely adopted, but I think with little justification, and only those are here made use of that have subsequently been more fully diagnosed by later authors, of whom Thomson, in his most excellent "Öfversigt af arterna inom slägtet *Bassus*, Fab." (Opusc. Ent. xiv, p. 1458), is certainly the foremost, though Vollenhoven, Bridgman, Brischke, and others have materially assisted. I attempted to revise the whole of the Palæarctic species in 1905 (Trans. Ent. Soc. pp. 419–438).

The economy of the Bassides is extremely interesting, but although many have been bred from Diptera, apparently confining their attacks to the Syrphidæ, which prey so exposedly and beneficially upon Aphididæ, very few details of their habits are at present available. I am not yet satisfied with the accuracy of Vollenhoven's assertion (Pinac., pl. i) that it is "proved that the larvæ of *Bassus* live also in larvæ of other orders" of insects.

As regards India, we appear to know little at present of this tribe. I can instance but a dozen species.

Table of Genera.

1 (2) Basal segments transimpressed; hind tibiæ white-banded . . . . Bassus, Fln., p. 275.
2 (1) Basal segments not impressed.
3 (4) Face punctate and very distinctly dull . Homocidus, Morl., [p. 282.
4 (3) Face glabrous and very distinctly nitidulous . . . . Promethus, Först., [p. 287.

Genus BASSUS, *Fln.*

Bassus, Fallén, Specim. Hym. 1813; Thomson, Opusc. Ent. xiv, 1890, p. 1470.

Genotype, *Ichneumon lætatorius*, F.

Head distinctly transverse and compressed; clypeus discrete; mandibles basally broad, becoming gradually contracted to their apices, with the upper of the two stout apical teeth bifid. Antennæ filiform Thorax stout and gibbulous, finely punctate and usually with broad and bright hamate humeral marks. Scutellum simply convex, usually entirely pale; metathorax short and in part carinate. Abdomen sessile and nearly parallel-sided, distinctly deplanate; basal segment subquadrate or slightly longer than broad, discally bicarinate; the last segment of female nearly invariably a little compressed laterally, with the terebra hardly or very shortly exserted. Legs of normal length, with the hind tibiæ always centrally white. Wings with no areolet.

Range. Cosmopolitan.

The centrally transimpressed basal segments will instantly distinguish this very distinct genus from the whole of the other ICHNEUMONIDÆ.

The name *Bassus*, apparently a word of no meaning, was first employed by Fabricius in his 'Systema Piezatorum' of 1804; but the concourse of species there assembled under this name is truly diverse and includes CRYPTINÆ, PIMPLINÆ, OPHIONINÆ, and even several kinds of BRACONIDÆ (*cf.* Curtis, Brit. Ent. pl. lxxiii). Several of his species, not one of which actually belongs here, are still catalogued under this genus by Dalla Torre, simply because they have never been subsequently recognised. But *Bassus lætatorius*, universally regarded as its type, was not even included here till so placed by Panzer in 1806. Nor can we at all suppose that Gravenhorst used the genus in the Fabrician sense, for it was originally described as having, *inter alia*, "corpus fere cylindricum, glabrum; antennis longitudine corporis; abdomine vix petiolato; aculeo varissime exserto," &c. The genus, as here defined, was in reality created by Fallén in his 'Specimen novam Hymenoptera disponendi methodum exhibens" of 1813.

Table of Species.

1	(8)	Abdominal segments not apically flavous-banded.	
2	(3)	Hind tibiæ red, white, and black ..	*lætatorius*, F., p. 276.
3	(2)	Hind tibiæ black and white.	
4	(5)	Hind coxæ entirely black..........	*varicoxa*, Thoms., p. 278.
5	(4)	Hind coxæ mainly or entirely pale.	
6	(7)	Central segments at most apically red	*tricinctus*, Grav., p. 278.
7	(6)	Central segments almost entirely red	*multicolor*, Grav., p. 279.
8	(1)	Abdominal segments apically flavous-banded.	
9	(10)	Areola obsolete; hind tibiæ basally flavous	*orientalis*, Cam., p. 280.
10	(9)	Areola entire; hind tibiæ basally black..........................	*clotho*, sp. n., p. 281.

194. **Bassus lætatorius**, *F.*

Ichneumon lætatorius. Fabricius, Spec. Ins. i. 1781, p. 424; Mant. Ins. i, 1787, p. 262; Piez. 1804, p. 63; Panzer, Faun. Germ. xix, p. 19.
Anomalon lætatorius, Jurine, Nouv. Méth. 1807, p. 116 (♀).
Bassus lætatorius, Panzer, Krit. Revis. ii, 1806, p. 74: Gravenhorst, Ichn. Eur. iii, 1829, p. 353; Zetterstedt, Ins. Lapp. p. 377; Ratzeburg, Ichn. d. Forst. ii, p. 109. Holmgren, Sv. Ak. Handl. 1855, p. 353, pl. ix, fig. 24; Vollenhoven, Pinac. pl. i. fig. 1: Thomson, Opusc. Ent. xiv, p. 1470: Davis, Trans. Amer. Ent. Soc. 1895, p. 21; Morley, Trans. Ent. Soc. 1905, p. 425 (♂ ♀).

Bassus albovarius, Wollaston, Ann. Nat. Hist. i, 1858, p. 23 (♂).
Bassus tripicticrus, Walsh, Trans. Acad. St. Louis, 1873, p. 85.
Scolobates varipes, Smith,* Trans. Ent. Soc. Lond. 1878, p. 3.
Bassus ventulus, Saussure, Grandidier, Hist. Madagascar, Hym. pl. xv, fig. 23 (♂).

A shining and distinctly punctate species, black, with the scutellum and the centre of the hind tibiæ white, the abdomen centrally and the apex of the hind tibiæ red. Face punctulate, clypeus discrete and apically emarginate. Mouth, facial orbits, a mark before the concolorous tegulæ, scutellum and post-scutellum white; antennæ beneath, the legs and centre or base of abdomen more or less broadly, red; hind tibiæ basally black, and black beyond the pure white central band, with the apex broadly red. Metathorax subrugose, with the areola short, entire and subtransverse. Abdomen deplanate and not apically compressed, with the first three segments strongly punctate or subscabriculous, bearing a distinct transverse impression beyond the centre of each; basal segment subquadrate, centrally elevated and bicarinate to the apical impression.

Fig. 70.—*Bassus lætatorius*, F.

Length $3\frac{3}{4}$–7 millim.

Baluchistan: Quetta, vii. 03 (*Col. Nurse*); Kashmir, v. 01 (*Col. Nurse*); Punjab: Gojra (Pusa coll.), Ferozepur, 640 ft., iv. 05 (*E. Brunetti*—Ind. Mus.); Rajputana: Mt. Abu (*Col. Nurse*). Cosmopolitan.

The extent of the red on the abdomen is the only variable feature of this very constant species; usually it extends throughout the second and third segments, but I possess females with the whole of the four basal segments red and others with the colour restricted to the extreme apex of the second. The tri-coloured tibiæ will instantly distinguish it from all other Bassides.

This is a very abundant species throughout Europe, and is one of the most cosmopolitan of all Ichneumonidæ; Ashmead says its distribution extends throughout Asia, Africa, Australia, New Zealand, Chatham Islands, Hawaii, Japan, the West Indies, and both North and South America (*cf.* also Schrottky, Ann. Mus. Buenos Aires, 1902, p. 93); in Britain it is abundant from the Isle of Wight to Yorkshire, from the end of May to September. I have taken it at artificial light; but it is most commonly found by sweeping herbage, and more especially upon horseradish, oats, reeds, and the flowers of *Heracleum*, *Angelica*, *Statice*, *Achillea*, and thistles; I have also observed the females abundantly upon

Polygonum plants. This species was first bred by Ratzeburg from the larva of some *Syrphus* fly in Saxony; subsequently Dr. Giraud raised it (Ann. Soc. Ent. France, 1877, p. 408) from *Syrphus balteatus* and another species from *Pipiza noctiluca*; and its association with these flies, which prey upon APHIDIDÆ, was suggested by Gravenhorst, who first took it among them. It has been reported to have been bred from the phytophagous beetle, *Adimonia rustica*, Schall., and from *Tortrices*, but probably in error.

I have examined, in the British Museum, the type of *Scolobates varipes*, Smith, described from a single female captured by Prof. Hutton at Otago in New Zealand, and find that it is entirely synonymous. Hudson (Entom. 1884, p. 171) records this species as preying upon the larvæ of *Syrphus ortas*, Walk.; and this is repeated by Smith (E. M. M. 1900, p. 161), who remarks upon its frequency upon the castor-oil plant (*Ricinus communis*), the fluid of which it eagerly assimilates. For an account of its life-history, *cf.* G. V. Hudson, 'An Elementary Manual of New Zealand Entomology,' London, 1892, p. 39, pl. iii, fig. 8.

195. Bassus varicoxa, *Thoms.*

Bassus albosignatus, var. 1, Gravenhorst, Ichn. Eur. iii. 1829, p. 344 (♀) (?); var. 3, Holmgren, Sv. Ak. Handl. 1855, p. 354.
Bassus varicoxa, Thomson, Opusc. Ent. xiv, 1890, p. 1640 (♀).

This species differs very little from *B. multicolor*, excepting in coloration. The abdomen is entirely black, with at most the incisures pale, the anterior or intermediate coxæ are partly and the whole of the hind coxæ are black, the hind tibiæ are broadly white in the centre and quite black (with no rufescence) at both extremities, and the epistoma is white-marked.

Length 5 millim.

It is a very common Palæarctic species, closely allied to *B. tricinctus*, Grav. (*nemoralis*, Holmg.), which differs in its entirely pale coxæ and larger size. I have seen a specimen in the Oxford Museum from Westwood's collection, which was captured long ago in "India" by Capt. Boys.

196. Bassus tricinctus, *Grav.*

Bassus albosignatus, var. 4, Gravenhorst, Ichn. Eur. iii. 1829, p. 345 (♂).
Bassus tricinctus, Gravenhorst, *op. cit.* p. 351 (♂); Morley, Trans. Ent. Soc. Lond. 1905, p. 425 (♂ ♀); *cf.* Brischke, Schr. Nat. Ges. Danz. 1878, p. 111.
Bassus flavolineatus, Zetterstedt (*nec* Grav.), Ins. Lapp. i, p. 378, excl. ♀ et var.
Bassus nemoralis, Holmgren, Sv. Ak. Handl. 1855, p. 354; Vollenhoven, Pinac. pl. i, fig. 3; Thomson, Opusc. Ent. xiv, p. 1469 (♂ ♀).

A distinctly punctate species, with the abdomen not or obso-

letely red-marked. Mouth, clypeus, facial orbits, and in ♂ epistoma, marks before the red tegulæ, scutellum apically or entirely, and hind tibial band, white. Legs totally red, with only the hind tarsi, and remainder of their tibiæ entirely, black. The ♂ with scape beneath and anterior coxæ entirely flavous; areola very small and irregular. Three first abdominal segments transversely impressed and (in the typical form) apically red; basal segment subquadrate, rugosely punctate and impressed before the centre, with discal carinæ extending nearly to the anteapical impression.

Length 4–5½ millim.

Sikkim: Darjiling, 7000 ft., viii. 09 (*C. Paiva*—Ind. Mus.); Bengal: Katihar, iii. 09 (*C. Paiva*); Rajputana: Mt. Abu (*Col. Nurse*). Palæarctic Region.

Holmgren's variety *nemoralis* differs from the type-form only in having the abdomen immaculate black; it is much commoner in Europe than that with the incisures red, and the Indian example belongs to it. From all others of this genus, except *B. multicolor*, the present species differs in its entirely pale, red or flavous, anterior coxæ and the bicoloured hind tibiæ.

This is an abundant species throughout the Palæarctic region and is met with by sweeping, but more usually on the heads of both *Heracleum* and *Angelica*, quite as often in their seeding as in their flowering condition, showing that it is probably not the blossoms which attract them. I have seen the female in England examining the stem of *Heracleum sphondylium* with her antennæ; it walked over the flowers heedlessly, but was much interested in the colony of *Aphis hieracii*, Kalt., which covered the plant, doubtless being in search of the larvæ of some *Syrphus*, from which genus I am not aware that the present species has yet been bred. The Indian specimens are sufficiently typical, though the white tibial band is somewhat broader and the discal carinæ of the basal segment less conspicuous than those of British specimens.

197. Bassus multicolor, *Grav.*

Bassus multicolor, Gravenhorst, Ichn. Eur. iii, 1829, p. 352 (♀); Vollenhoven, Pinac. pl. i, fig. 4 (♂); Holmgren, Sv. Ak. Handl. 1855, p. 355; Morley, Trans. Ent. Soc. Lond. 1905, p. 425 (♂ ♀).
Bassus deletus, Thomson, Opusc. Ent. xiv, 1890, p. 1471 (♂ ♀).

A punctulate and not very shining species, with the hind tibiæ obsoletely red at their apices. *Head* with the mouth, disc or (in ♂) whole of clypeus, internal orbits or (in ♂) whole face, flavous; frons smooth or sulcate. *Antennæ* black, filiform and shorter than the body, with the flagellum ferruginous beneath; scape of ♂ flavous below. *Thorax* black, stout and gibbous, with a mark before and a short line beneath the radices flavous; pleuræ strongly nitidulous and obsoletely punctulate; metathorax rugulose, with the areæ obsolete and areola very small. *Scutellum*

and postscutellum flavous. *Abdomen* deplanate, black, with the second to fourth segments more or less broadly, usually with their apical half, dull red or badious and transversely impressed; basal segment scabriculous, basally impressed and at least in ♀ apically white; the gastrocœli of the second distinct; terebra subexserted. *Legs* fulvous; coxæ flavous, with the hind ones always basally black; hind tibiæ broadly white, black at the base and before apex, the extreme apex (at least internally) always red. *Wings* slightly clouded, with the stigma and radius infuscate, tegulæ and radix flavous.

Length 5–7 millim.

Bengal: Patna and Pusa (Pusa coll.); Bombay (Oxf. Mus.). Europe.

Type in the Breslau Museum.

This is a somewhat uncommon Palæarctic species, first described by Gravenhorst from Piedmont in 1829; and in Britain apparently confined to its southern half. It has not yet been bred, but is confined to marshy districts, where it is on the wing in June. It has not hitherto been recorded from beyond the confines of Central Europe, but I have seen in the Pusa collection a dozen specimens of both sexes from Bengal, taken in February and March on grass, lucerne, cauliflower, and mustard, and in wheat-fields, for the most part at Pusa.

198. Bassus orientalis, *Cam.*

Bassus orientalis, Cameron, Spol. Zeyl. 1905, p. 131 (♂).

♂. A black and profusely pale-marked species, with the abdomen and hind tibiæ not at all red. *Head* black, with the white-pilose face, clypeus, mandibles, palpi, and frontal orbits stramineous; clypeus basally and laterally rounded, apically slightly but distinctly incised, with its lateral sutures straight and oblique; vertex and frons finely punctate, the latter longitudinally sulcate centrally. *Antennæ* with the scape flavous, and the flagellum piceous, beneath. *Thorax* closely punctate; propleuræ basally above the radices, and elongate subhamate callosities before the front ones, others beneath both pairs of radices, stramineous; metanotum more closely and rugosely punctate, with the petiolar area closely distinctly reticulate and basally carinate; metapleuræ glabrous below the lateral carinæ, and rugulosely punctate above them. *Scutellum* and postscutellum stramineous. *Abdomen* black, with the first segment

Fig. 71.
Bassus orientalis, Cam.

centrally elevated and impressed; three basal segments closely, distinctly, and rugosely punctate, narrowly stramineous apically, with the two posterior centrally interrupted; basal half of fourth and basal third of fifth rugulosely punctate, apical half of fourth sparsely punctate; second to fifth segments transversely impressed. *Legs*: anterior pairs flavous, with their femora and the hind coxæ subfulvous; hind femora fulvescent, their tibiæ flavous to shortly beyond the centre, with the apex and their tarsi black. *Wings* hyaline, with the stigma and nervures black.

The ♀ differs only in having the epistoma black, the propleuræ immaculate, the metapleuræ finely punctate below, and the hind tibiæ blackish at the extreme base.

Length 6 millim.

ASSAM: Shillong, 6000 ft., vi. 03 (*Rowland Turner*); BENGAL: Bettia, iii. 08, and Katibar, iii. 09 (*C. Paiva*—Ind. Mus.); CEYLON: Peradeniya (*E E. Green*).

This species is said to be allied to the Palæarctic *B. multicolor*, Grav., from which it materially differs in the abdominal coloration, and from all the members of this restricted genus, with which I am acquainted, in having the base of the ♂ hind tibiæ entirely pale.

It has been bred by Mr. Ernest E. Green, at Peradeniya, from the larvæ of Syrphid flies preying upon the Tea Aphis (*Ceylonia theicola*, Buckton).

199. **Bassus clotho**, sp. n.

♂ ♀. A small and stout species, with the head, thorax, scutellum, and apices of the segments, broadly flavous; the legs mainly pale and the hind tibiæ broadly pure white. *Head* hardly narrower than thorax, flavous, with its base black to the scrobes; face finely and evenly punctate, somewhat nitidulous; clypeus small and apically subincised. *Antennæ* basally flavous beneath. *Thorax* stout and finely punctate, black, with prosternum, hamate callosities before radices broadly, others beneath all radices, and a basal perpendicular fascia on base of mesopleuræ, flavous; metathorax rugose and strongly carinate, with the areola small, distinct and subquadrate, apically emarginate; petiolar area large and subtriangular, apically impressed on either side; metapleuræ glabrous below, and punctate above, the lateral carinæ. *Scutellum* and postscutellum entirely flavous. *Abdomen* rugulose and somewhat broad, with the strongly transimpressed four basal segments very broadly, the remainder very narrowly, bright flavous apically both above and below; ♀ with second to fourth segmental bands centrally interrupted; first segment strongly and subcoalescently bicarinate at base, anus with griseous pilosity. *Legs* flavous, with the hind femora fulvous; hind tibiæ and tarsi black, with the centre only of the former clear white. *Wings* broad and hyaline, with no areolet, and the stigma piceous; radix and tegulæ flavous.

Length 5 millim.

Kashmir, 6000–7000 ft., v.01 (*Col. Nurse*); Bengal: Pusa; Central Provinces: Nagpur (Pusa coll.); Bombay: Surat, i.04 (Pusa coll.), Poona, viii.86 (*R. C. Wroughton*, type).

Type in the British Museum.

It is closely allied to *B. orientalis*, and the divergences are little more than omissions in Cameron's description; the abdomen is more broadly flavous and the fourth segment in particular, the hind tibiæ are basally black and centrally white, and the metanotal areola is entire and very distinct. From *B. tricinctus*, Grav., it differs in its stouter and more compact form, the greater convexity of the abdomen, and the much broader segmental fasciæ.

The species is probably not uncommon in Bengal, where Mr. Maxwell Lefroy has bred it (as he believes) from the sawfly, *Athalia proxima*, Klug, on 8th December, 1906, and both sexes from (more correctly, doubtless) *Syrphus ægyptius*, Wied., at Surat.

Genus **HOMOCIDUS**, *Morl.*

Homocidus, Morley, Ichn. Brit. iv, 1911, p. 87.
Homoporus, Thomson, Opusc. Ent. xiv, 1890, p. 1488 (*nec* Hym. Scand. 1878, p. 64).
Homotropus, Förster, Verh. pr. Rheinl. 1868, p. 162 (part.).

Genotype, *Bassus tarsatorius*, Panz.

This genus is instantly distinguished from *Bassus*, as here restricted, by the lack of transverse impressions on the basal segments, its more slender conformation, and more nitidulous tegument. From the other genera of the Bassides it will easily be recognised by the small and immaculate metathoracic spiracles, simple scutellar fovea, punctate and more or less dull face, which is not distinctly impressed longitudinally, the obsolete notauli, not deeply excised scape, and by the hind tibiæ having no sharply defined white central cincture.

Range. Palæarctic and Nearctic Regions.

At least thirty-five Palæarctic species of this genus are now known; but only three from America have elsewhere been described. Our present knowledge is limited to a single Asian species, which has been erroneously described as new by Cameron, and three others that I have seen in collections.

Table of Species.

1	(4) Areolet wanting; anus of ♀ not compressed.	
2	(3) Basal metanotal areæ entire and somewhat strong	*cinctus*, Grav., p. 283.
3	(2) Metanotal areæ entirely wanting	*tarsatorius*, Pz., p. 283.
4	(1) Areolet present; anus of ♀ strongly compressed.	
5	(6) Hind tibiæ basally white; petiolar carinæ strong	*ornatus*, Grav., p. 285.
6	(5) Hind tibiæ mainly white; petiolar carinæ obsolete	*dimidiatus*, Schr., p. 286.

200. **Homocidus cinctus**, *Grav.*

Bassus cinctus, Gravenhorst, Ichn. Eur. iii, 1829, p. 327; Holmgren, Sv. Ak. Handl. 1855, p. 356; Vollenhoven, Pinac. pl. i, fig. 6 (♂); id., Tijds. Ent. 1878, p. 162 (♀).
Bassus lateralis, Gravenhorst, *op. cit.* p. 342 (♂); Holmgren, *op. cit.* p. 355; Vollenhoven, Pinac. pl. i, fig. 5 (♂ ♀).
Bassus albicinctus, Desvignes, Trans. Ent. Soc. Lond. 1862, p. 218 (♂).
Bassus hyperboreus, Marshall,* Ent. Month. Mag. xiii, 1877, p. 241 (♂).
Homoporus lateralis, Thomson, Opusc. Ent. xiv, 1890, p. 1492 (♂ ♀).
Homoporus cinctus, Morley, Trans. Ent. Soc. Lond. 1905, p. 426 (♂ ♀).

Nitidulous, punctulate, black. *Head* fully as broad as thorax; frons anteriorly impressed and subcanaliculate; mouth, clypeus, inner orbits (♀), or whole face (♂), flavous. *Antennæ* shorter than body; scape of ♂ stramineous beneath. *Thorax* stout and gibbous, with (typical form) or without (var. *scabriculus*) a mark before the pale tegulæ, and rarely in ♂ (var. *albicinctus*) pleural suture and pale spots, flavous; areola quite distinctly delineated, entire, transverse or subquadrate; metathorax subrugulose. *Scutellum* and sometimes postscutellum apically stramineous. *Abdomen* with the subscabriculous three or four basal segments apically flavescent throughout (typical form) or with their lateral angles alone pale (var. *lateralis*); basal segment of ♀ subquadrate, of ♂ a little longer than broad, basally dilated, with the discal carinæ not very distinct. *Legs* red, with the hind tarsi and apices of their tibiæ blackish; anterior coxæ entirely and the hind ones apically, with all the trochanters, flavous. *Wings* with transverse anal nervure intercepted in or slightly below the centre.

Length 3½–6 millim.

SIKKIM: Darjiling, 6000 ft., ix. 08 (*E. Brunetti*—Ind. Mus.). EUROPE.

Type in the Breslau Museum.

This species is entirely distinct in its complete metathoracic areola and pale hind femora. The synonymy of Marshall's insect, which I have examined in his collection in the British Museum, has not before been brought forward.

H. cinctus has not been very widely noticed in Europe, and I do not find it given anywhere as occurring further east than Germany; in Britain it is common and frequently beaten from undergrowth in woods in June, but its economy is unknown. A single male was taken by my friend Mr. Brunetti by sweeping grass and low herbage at Darjiling.

201. **Homocidus tarsatorius**, *Pz.*

Bassus tarsatorius, Panzer, Faun. Germ. ix, 1805, p. 102; Gravenhorst, Ichn. Eur. iii, 1829, p. 932.
Bassus exultans, Gravenhorst, *op. cit.* p. 328 (♂); Ratzeburg, Ichn. d. Forst. i, p. 122; Holmgren, Sv. Ak. Handl. 1855, p. 359 (♂ ♀), excl. var. 1.

Bassus insignis, Gravenhorst, *op. cit.* p. 349; Holmgren, *op. cit.* p. 360; Brischke, Schr. Nat. Ges. Danz. 1878, p. 112 (♀).
Bassus pulchellus, Desvignes (*nec* Holmg.), Trans. Ent. Soc. Lond. 1862, p. 221 (♂).
Bassus desvignesii, Marshall, Cat. Brit. Hym. 1872, p. 82.
Homoporus tarsatorius, Thomson, Opusc. Ent. xiv, 1890, p. 1503; Morley, Trans. Ent. Soc. Lond. 1905, p. 427 (♂ ♀).
Bassus indicus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 728 (♂).
Var. *Bassus flavus*, Desvignes, Trans. Ent. Soc. Lond. 1862, p. 219 (♂).

A black and somewhat shining species, with the head, thorax, and scutellum broadly, and apices of all the abdominal segments narrowly stramineous; the legs entirely pale fulvous with only the hind tarsi, and apices of their tibiæ, black. Vertex more or

Fig. 72.—*Homocidus tarsatorius*, Panz.

less emarginate; metathoracic carinæ entirely wanting; scutellum simply convex and, like the postscutellum, pale; hind tibiæ red, with only the apical third black; areolet almost invariably wanting.

Length 6 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*). EUROPE.

Type. Location unknown; that of *Bassus indicus* in Col. Nurse's collection.

This is the only species of BASSIDES I know that may or may not possess an areolet; when present (var. *flavus*, Desv.) it is very small and oblique, consisting of little more than the duplication of its basal nervure; this form is, however, very rare indeed.

The typical male of *B. indicus*, which I have examined, differs from the usual European form of this species in nothing but its more deeply transimpressed metanotum, which is in no way carinate, and its somewhat less prominent petiolar spiracles; there can remain no doubt respecting their identity.

H. tarsatorius is an abundant species throughout the Palæarctic region, and may be found in woods and marshes throughout the spring in Britain, as well as upon umbelliferous flowers in the autumn. It is said to have been bred from such diverse hosts as the larva of the Dipterous *Syrphus balteatus*, L., the Tineid moth *Depressaria angeliella*, and a species of Ladybird (*Coccinella*), but the two latter records are in all probability erroneous.

202. **Homocidus ornatus**, *Grav.*

Bassus deplanatus, Gravenhorst, Ichn. Eur. iii, 1829, p. 340 (excl. ♂).
Bassus ornatus, Gravenhorst, *op. cit.* p. 341 ; Brischke, Schr. Nat. Ges. Danz. 1878, p. 113 (♂).
Bassus frenator, Desvignes, Trans. Ent. Soc. Lond. 1862, p. 218 (♂).
Homoporus ornatus, Thomson, Opusc. Ent. xiv, 1890, p. 1505; Morley, Trans. Ent. Soc. Lond. 1905, p. 427 (♂ ♀).
Var. *Bassus deplanatus*, Holmgren, Sv. Ak. Handl. 1855, p. 362.

A dull and coarsely punctate black species ; legs red, with the hind tarsi and nearly the whole of their tibiæ, except the white extreme base, black ; scutellum transversely white apically ; mouth and clypeus pale, flagellum rufescent beneath ; petiolar carinæ parallel.

At once known from all its allies, except *H. deplanatus*, by the distinct areolet, rugulose basal segments of the immaculate abdomen, dull black hind tibiæ, of which the extreme base and inner side basally only are pure white, and by the petiolar carinæ extending to its apex. The head is as broad as the thorax, constricted posteriorly ; clypeus, mandibles and mouth pale, or in ♂ with the whole face also flavous ; antennæ quite filiform, with the flagellum distinctly rufescent beneath ; metathorax subrugose, with the basal and petiolar areæ more or less distinctly indicated, though never entire ; wings with the areolet complete, small and subpetiolate ; abdomen deplanate and apically obtuse ; basal segment with two strong and parallel carinæ to apex of the quadrate postpetiole, the second transverse and coarsely striolate, with distinct thyridii ; legs stout and red. The ♂ also has mesonotal humeral markings, a mesosternal lunula, the anterior coxæ, and ventral plica, pale.

Length 5–7 millim.

PUNJAB : Kangra Valley, 4500 ft., x. 99 (*G. C. Dudgeon*).

Type in the Breslau Museum.

This is a not very common species throughout Northern and Central Europe ; in Britain I have only found it on the sea-shore, though it is recorded from several inland localities. It is said to prey upon species of *Syrphus*, and has been, almost certainly erroneously, thought to prey upon the moth, *Scotogramma trifolii* by Boie. A single example, differing in no way from the western form, is in the British Museum, from the Kangra Valley.

203. **Homocidus dimidiatus**, *Schr.*

Ichneumon dimidiatus, Schrank, Fauna Boica, ii, p. 293; Gravenhorst, Ichn. Eur. iii, 1829, p. 950 (♂).
Bassus pictus, Gravenhorst, *op. cit.* p. 336 (♂ ♀); Holmgren, Sv. Ak. Handl. 1855, p. 361 (♀).
Bassus dimidiatus, Holmgren, *op. cit.* p. 363 (♂).
Bassus planus, Desvignes, Trans. Ent. Soc. Lond. 1862, p. 220 (♂ ♀).
Homoporus pictus, Thomson, Opusc. Ent. xiv, 1890, p. 1511 (♂ ♀).
Homoporus dimidiatus, Morley, Trans. Ent. Soc. Lond. 1905, p. 428 (♂ ♀).

Head almost broader than thorax, somewhat constricted posteriorly, vertex somewhat angularly emarginate; frons nitidulous and not sulcate, though impressed above scrobes; face subdilated apically, with epistoma hardly elevated, of ♀ sometimes white-marked; ♂ with face and cheeks broadly, and mouth, pale; clypeus deplanate, subpunctate, with the apex obviously emarginate centrally and the sides foveolate; cheeks almost longer than base of the often pale mandibles; palpi infuscate or whitish. *Antennæ* black throughout in ♀, pale beneath in ♂; their apices subattenuate and the flagellum, of about twenty-two joints, reaching beyond the thorax. *Thorax* black, somewhat shining and very finely punctate; a large subhamate humeral mark white, ♂ also with a large pronotal mark, mesosternum apically, and pleural lines, white: mesosternum densely and very finely punctate, with speculum not smooth; metathorax finely punctate, apically subrugose, with all areæ wanting, and lateral costæ subobsolete. *Scutellum* apically and laterally lined with white, rarely immaculate in ♂. *Abdomen* black, half as long again as thorax, apically smooth and hardly compressed; first segment short, basally excavate and coarsely punctate, with no carinæ, postpetiole transverse, spiracles not prominent; second segment subtransverse, sparsely punctate and, between the transversely oval thyridii, densely striolate; third in ♂ with a more or less conspicuous pale fascia. *Legs* somewhat stout and red, with the anterior pairs basally paler in ♂ and sometimes black-marked in ♀; hind tarsi and tibiæ black, the latter sparsely setiferous externally and white nearly to their centre internally in ♀, or mainly testaceous in ♂, which also often has an infuscate band before, though never at, the base. *Wings* hyaline, stigma infuscate and not broad, basally pale; areolet irregular and subsessile; nervellus oblique, intercepted far below its centre.

Length 5–6½ millim.

SIKKIM: Darjiling, 6000 ft., ix. 09 (*E. Brunetti*). EUROPE.

This is an abundant and widely distributed species in Western Europe. It is found upon flowers throughout the summer and, though we know nothing of its economy, we may suspect it of attacking Syrphid flies, since I took a female investigating a colony of *Aphis hieracii*, in June 1903. I have seen but a single female from India.

Genus PROMETHUS, *Thoms.*

Promethes, Förster, Verh. pr. Rheinl. 1868, p. 162 (part.).
Promethus, Thomson, Opusc. Ent. xiv, 1890, p. 1475.
Sussaba, Cameron, Journ. Bombay Nat. Hist. Soc. 1909, p. 728.

GENOTYPE, *Bassus sulcator*, Grav.

This genus contains the smallest and most fragile species of the genus *Bassus* (*sensu* Holmg.). It is at once recognised by the entirely glabrous and very strongly nitidulous face in both sexes and may be known from all other BASSIDES by having the metathoracic spiracles small and immaculate, the scutellar fovea simple and not transcarinate, by its lack of an areolet and its never entirely black abdomen.

Range. Palæarctic and Oriental Regions.

Some eleven Palæarctic and three or four American species have been described, but what it lacks in specific numbers is compensated in that of individuals, for in Europe it is extremely abundant throughout the summer on low herbage, more especially in moist situations. It has very rarely been bred, and then, like its immediate allies, the host has almost invariably proved to be the larvæ of aphidivorous SYRPHIDÆ.

But a single species, erroneously placed by Cameron in a new genus, has hitherto been recorded from India, though further investigation will in all probability prove it to be of very general distribution in the more temperate regions.

Table of Species.

1 (2) Basal segment twice as long as broad; 2nd basally striate .... *sulcator*, Grav.
2 (1) Basal segment half as long again as broad; 2nd mainly striate .... *pulchellus*, Holmg.

204. Promethus sulcator, *Grav.*

Bassus sulcator. Gravenhorst, Ichn. Eur. iii, 1829, p. 320, excl. var. 1 (♂ ♀); *cf.* Holmgren, Sv. Ak. Handl. 1854, p. 84.
Bassus festivus, Zetterstedt (*nec* Fab.), Ins. Lapp. i, p. 378 (♀).
Bassus areolatus, Holmgren, Sv. Ak. Handl. 1854, p. 85; *op. cit.* 1855, p. 365 (♂ ♀); *cf.* Brischke, Schr. Nat. Ges. Danz. 1878, p. 113 (♀).
Promethus sulcator, Thomson, Opusc. Ent. xiv. 1890, p. 1479; Morley, Trans. Ent. Soc. Lond. 1905, p. 429 (♂ ♀).

A slender black species. *Head* as broad as thorax and triangular; cheeks elongate, epistoma of ♀ not pale; frons smooth and centrally subsulcate; clypeus unequally foveolate and apically slightly emarginate; ♂ with face, cheeks and frontal orbits shortly stramineous; ♀ with mouth and clypeus pale. *Antennæ* elongate, slender, filiform, reaching beyond the thorax nearly to

the anus, basally nigrescent or, especially in ♂, pale beneath. *Thorax* discally shining and nearly smooth throughout, black, with no pale humeral marks; notauli indicated, pleuræ smooth; basal metanotal area distinct and subquadrate; petiolar area large, subovate and nitidulous. *Scutellum* black and subconvex. *Abdomen* black, with segments three, four, and apex of second red, fifth rarely red; basal segment aciculate, twice as long as broad, parallel-sided, with the spiracles not very prominent; second basally a little constricted and substriate between the distinct and subpellucid thyridii; anus of ♀ by no means strongly compressed. *Legs* slender and fulvous, with all the trochanters and the anterior coxæ pale testaceous or, in ♂, flavous; hind tarsi of ♂ subinfuscate. *Wings* with tegulæ flavous; stigma pale and apically darker, or in ♂ infuscate and basally paler; nervellus opposite and intercepted below its centre.

Fig. 73.—*Promethus sulcator*, Grav.

The ♂ abdomen is rarely black-marked centrally.

Length 4–6 millim.

SIKKIM: Darjiling, 6000 ft., ix. 08 (*E. Brunetti*—Ind. Mus.). EUROPE.

Type in the Breslau Museum.

This is a very abundant species in Western Europe from Lapland to Hungary. It is captured by sweeping throughout the summer, and is occasionally seen upon umbelliferous flowers; Holmgren once bred it from an unknown species of *Syrphus* fly in Sweden. Brunetti took a single rather dark male by sweeping grass and low herbage at Darjiling.

205. **Promethus pulchellus**, *Holmg.*

Bassus sulcator, var. 1 ♂, vars. 3 et 4 ♂ ♀, Gravenhorst, Ichn. Eur. iii, 1829, p. 321.
Bassus festivus, vars. 2 et 3, Gravenhorst, *op. cit.* p. 316 (♂ ♀).
Bassus pulchellus, Holmgren (*nec* Desv.), Sv. Ak. Handl 1855, p. 366 (♂ ♀); Brischke, Schr. Nat. Ges. Danz. 1878, p. 113.
Promethus pulchellus, Thomson, Opusc. Ent. xiv, 1890, p. 1483; Morley, Trans. Ent. Soc. Lond. 1905, p. 429 (♂ ♀).
Sussaba bicarinata, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 728 (♀).

A shining and punctulate, mainly black species. *Head* broad,

of ♀ with mouth and a facial mark, of ♂ with mouth and whole face, flavous; clypeus apically strongly depressed, subfoveolate; face glabrous and strongly nitidulous; frons nearly smooth. *Antennæ* immaculate and (in ♂) flavescent beneath. *Thorax* black, with the mesonotum somewhat dull and distinctly punctate; callosities before and beneath radices, and in ♂ the sternum and pleural sutures partly flavous; metathoracic areola small, distinct and subquadrate; petiolar area large, finely scabriculous and laterally carinate. *Scutellum* black. *Abdomen* cylindrical, more or less broadly dull red centrally, not trans-impressed, of ♀ apically compressed; basal segment scabriculous and half as long again as broad, parallel-sided and centrally impressed basally; second segment aciculate to near its apex, with the gastrocœli distinctly impressed; remainder smooth and nitidulous, with no citrinous markings. *Legs* slender and red; anterior coxæ flavidous, in ♀ with their base and majority of the hind ones black. *Wings* hyaline; tegulæ flavous; nervellus subopposite and intercepted slightly below its centre.

Length 5 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*). EUROPE.

Type in the Stockholm Museum.

This species has been supposed to have a limited distribution through Central and Northern Europe, but is evidently much more wide-spread, since no doubt can be entertained respecting the synonymy of *Sussaba bicarinata*, the unique type of which I have examined in Col. Nurse's collection; in the latter the coloration of the hind femora is somewhat darker than in typical specimens, but I have taken males with blackish hind femora in Britain, where this is an abundant species from May to October, though nowhere yet bred in captivity.

Tribe *EXOCHIDES*.

The members of this tribe are instantly and infallibly recognised from the whole of the other ICHNEUMONIDÆ by the peculiar conformation of the head. This, viewed from above, appears subcircular and stout, but laterally the contour is seen to be very irregular, since the frons is strongly excavate above the antennæ, which rise from the upper margin of the strongly prominent face in such a manner that the continuity of the head is entirely interrupted in front by a transverse sulcus behind the scrobes. The face is strongly convex, continuous with the clypeus, and usually coarsely and evenly punctate. The body is strongly nitidulous, with the thorax discally subdeplanate, and the abdomen fusiform and strongly convex. The legs are always more or less incrassate and never elongate. The wings are narrow and often lack all trace of an areolet, which would appear to be a somewhat inconstant feature in this group.

About half the Palæarctic genera are now recorded from India, including two erroneously supposed to be new by Cameron, who has further erected two which appear to me to be valid (though one of them I have not seen), and these, together with one herein brought forward, give us a total of eight from the Oriental Region. This comparatively large number may perhaps be accounted for by the fact that these insects attack, so far as we know at present, Le idoptera and not TENTHREDINIDÆ.

Table of Genera.

1	(16)	Flagellum filiform, its basal joint elongate.	
2	(13)	Antennæ distinctly shorter than body; flagellar joints cylindrical.	
3	(6)	Scutellum laterally margined; metathoracic spiracles sublinear.	
4	(5)	Metanotum not areated; head posteriorly broad	AITHRIS, Cam., p. 290.
5	(4)	Metanotum fully areated; head posteriorly very narrow	XANTHEXOCHUS, gen. n., [p. 292.
6	(2)	Scutellum without a lateral margin; metathoracic spiracles oval or circular.	
7	(10)	Areolet wanting.	
8	(9)	Basal metathoracic area not discrete from areola	EXOCHUS, Grav., p. 293.
9	(8)	Basal area discrete from areola	POLYCLISTUS, Först., [p. 298.
10	(7)	Areolet present.	
11	(12)	Basal segment of abdomen elongate and discally bicarinate.	TRICLISTUS, Först., p. 300.
12	(11)	Basal segment quadrate and discally smooth	MEGATREMA, Cam., [p. 304.
13	(3)	Antennæ as long as body, or flagellar joints denticulate.	
14	(15)	Metanotum subglabrous, with all areæ obsolete.	COLPOTROCHIA, Holmg., [p. 305.
15	(14)	Metanotum rugulose, with complete areæ	HYPERACMUS, Holmg., [p. 308.
16	(1)	Flagellum setiform, its basal joint transverse	SETICORNUTA, gen. n., [p. 310.

Genus **AITHRIS**, *Cam.*

Aithris, Cameron, Manch. Mem. 1900, p. 106.

GENOTYPE, *A. cornutus*, Cam.

Head buccate and broad behind the large, emarginate and not apically convergent eyes; cheeks short, labrum not exserted, clypeus not discrete, mandibles stoutly bidentate; occiput immarginate, frons apically prominent; vertex deeply impressed centrally, ocelli large. Flagellum with the two basal joints of equal length. Mesopleuræ centrally prominent and basally

depressed; metanotum with no areæ, its lateral carinæ stout and obliquely inflexed; spiracles large and linear. Scutellum deplanate and stoutly carinate laterally to beyond its centre; postscutellum basally bifoveolate. Abdomen smooth and dilated throughout, shining; first as long as the two following segments, laterally carinate above to the spiracles and below to its apex, gradually dilated from centre, with spiracles small, circular and slightly beyond centre; gastrocœli obsolete; second to fourth segments of equal length. Legs stout, with the femora incrassate; hind legs with apical tarsal joint as long as the three preceding, their tibiæ bicalcarate; calcaria short and stout; front tarsi with the first joint basally excised and as long as the apical, the intermediate stout, with calcaria reaching centre of metatarsus. Wings with no areolet, first abscissa of the radial nervure straight and oblique, the second basally reflexed; recurrent nervure curved and nearly continuous with the transverse cubital; lower basal emitted from the median nervure beyond the upper basal.

Range. Assam.

This genus is said by its author to be closely related to *Exochus*, "but is abundantly distinct from anything described"; as a matter of fact, it appears to differ from *Colpotrochia* in little but its shorter antennæ.

206. **Aithris cornutus**, *Cam.* (emend.).

Aithris coenutus, Cameron,* Manch. Mem. 1900, p. 107 (♀, as ♂).

♀. A stout black species, with the antennæ rufescent, and the legs and abdomen partly flavous. *Head* black, with the base of

Fig. 74.—*Aithris cornutus*, Cam.

the mandibles broadly and the clypeus apically testaceous, and the palpi flavous; face deeply and strongly punctate; frons and

vertex smooth and nitidulous, with sparse short pilosity, that of the face longer and denser. *Antennæ* rufo-testaceous, not as long as the body, with dense pale pubescence and not strongly attenuate apically. *Thorax* smooth, shining and immaculate, with the pleuræ and metanotum with dense long pale hairs; propleuræ apically crenulate, mesopleuræ finely punctate, with the apical half broadly excavate; metapleuræ longitudinally bicarinate on either side of the spiracles. *Scutellum* and postscutellum entirely flavous. *Abdomen* smooth and shining, deep black, with the third and apical half of the second segment flavous. *Legs* black and stout, with the hind tarsi infuscate; front legs (except basally) and a large external mark on their femora, basal half of intermediate tarsi and of their tibiæ and apices of their femora, and basal two-thirds of hind tibiæ, flavous. *Wings* hyaline, with the stigma and nervures infuscate, and the tegulæ flavous.

Length 7 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Genus **XANTHEXOCHUS**, gen. nov.

Genotype, *X. scutellatus*, Morl.

Body testaceous and nitidulous; size not small. Head strongly transverse and abruptly constricted behind the eyes; frons concave and centrally prominent; face protuberant and not discrete from the clypeus; occiput vertically declivous from the ocelli. Metathorax with basal area obsolete; areola transverse and hexagonal, carinate throughout; petiolar area longer than areola and obliquely declivous; dentiparal longer than external areæ; spiracles elongate. Scutellum strongly deplanate and laterally bordered to near apex. Basal abdominal segment not longer than apically wide, broadly sessile and not bicarinate beyond its centre; valvulæ large, terebra not exserted. Legs very stout; posterior calcaria unequal in length. Wings somewhat ample and not narrow; areolet wanting; upper basal forming right angle with median nervure; nervellus antefurcal and intercepted near its lower angle.

Range. Assam.

This genus bears the same relationship to *Exochus* that *Xanthopimpla* does to *Pimpla*. It will at once be recognised from all described Exochides by the strongly deplanate and laterally bordered scutellum, the elongate petiolar area, the transverse areola, which is basally distinctly discrete from the very small basal area, the conspicuous frontal tubercle and the subtransverse basal abdominal segment. The pale colour and large size are remarkable. I have seen but a single species.

207. **Xanthexochus scutellatus**, sp. n.

♀. A large, flavo-testaceous species, with sparse black markings. *Head* pale, with only the ocelli, occiput, and unequal mandibular teeth, black; face coarsely and evenly punctate, clypeus smoother. *Antennæ* black; scape entirely flavous, and the flagellum rufescent beneath. *Thorax* testaceous, with the base of the mesonotum (whence proceed three testaceous discal stripes), and the postscutellar frenum narrowly, black; notauli distinct, superficial, and not short. *Scutellum* and postscutellum flavous. *Abdomen* convex, nitidulous, pilose, subparallel-sided, and pale testaceous, with the base of all the transverse segments indeterminately and narrowly blackish. *Legs* flavescent, with the pulvilli, posterior claws, base of hind tibiæ, and extreme apex of their femora, black. *Wings* hyaline, with radix and tegulæ flavous and stigma infuscate.

Fig. 75.
Xanthexochus scutellatus, Morl.

Length 10 millim.

ASSAM: Chandkhira, Sylhet (*J. L. Sherwill*).

Type in the British Museum.

Described from a single female.

Genus **EXOCHUS**, *Grav.*

Exochus, Gravenhorst, Ichn. Eur. ii, 1829, p. 328; Thomson, Deut. Ent. Zeit. 1887, p. 207.

GENOTYPE, *Ichneumon gravipes*, Grav.

A genus of small, shining black species with prominent face and no areolet. Head transverse, with the vertex not narrow, often with pale markings laterally; occiput declivous and more or less excavate; frons impressed above the scrobes, with no cristulæ; face strongly convex and somewhat strongly punctate; cheeks often with an impressed sulcus and their costæ usually inflexed; eyes always broader below and internally more or less emarginate. Antennæ shorter than the body, stout, filiform or subsetaceous, emitted from the top of the facial prominence. Thorax stout, usually deplanate, with the pronotal epomiæ distinct and nitidulous; notauli wanting or punctiform; areola confluent with basal area, with no dividing carina; costulæ stronger in ♂; petiolar area not discrete; spiracles oval or subcircular. Scutellum with no lateral margin. Abdomen

nitidulous, smooth or finely punctate; basal segment with discal carinæ not extending to apex; the next two or three segments laterally margined beyond their centre, with broad epipleuræ; sixth ventral of ♀ prominent, terebra usually concealed, hypopygium retracted. Legs, and especially the femora, stout and not elongate, with the claws stout; intermediate tibiæ with calcaria of very unequal length. Wings not broad, with the nervulus nearly always oblique and postfurcal, rarely interstitial; areolet wanting; parallel nervure emitted from below centre of brachial cell; lower wings with the nervellus oblique and distinctly antefurcal.

Range. Palæarctic and Nearctic Regions.

Thomson says (*loc. cit.* p. 198) that this genus, which originally included the whole tribe, as understood by Gravenhorst, is distinguished from *Polyclistus* by its strongly unequal intermediate calcaria, the pale markings on the head, the somewhat less prominent face, less abruptly declivous occiput, and the less constricted first abdominal segment; I have, however, followed Förster's clearer, though perhaps no more constant, definition by placing herein those species with the basal metathoracic area confluent with the areola, and reserving for *Polyclistus* those in which these two areæ are distinctly divided by a transverse costa.

Table of Species.

1 (4) Nervellus geniculate before bottom; thorax not broadly flavous.
2 (3) Scutellum flavous; thorax shining and finely punctate .... *xanthopus*, Cam., p. 294.
3 (2) Scutellum black; thorax dull and closely punctate .... *parca*, sp. n., p. 296.
4 (1) Nervellus geniculate at bottom; thorax broadly flavous.
5 (6) Metathoracic areæ incomplete; basal nervure subcontinuous .... *coronellus*, sp. n., p. 296.
6 (5) Metathoracic areæ complete: basal nervure not continuous.
7 (8) Vertex of head narrower; mesonotum discally black .... *flavicaput*, sp. n., p. 297.
8 (7) Vertex of head broader; mesonotum discally flavous .... *flavinotum*, sp. n., p. 298.

208. **Exochus xanthopus**, *Cam.*

Exochus xanthopus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1902, p. 430 (♂).

♂. A black and shining species, profusely marked with flavous. *Head* broadly rounded behind the internally very slightly emarginate eyes; occiput deplanate, longitudinally impressed centrally, not abruptly declivous nor bordered below; frons finely punctulate, centrally convex, and finely carinate

longitudinally; vertical orbits broadly and triangularly, frontal more narrowly, flavous; face, mouth, and cheeks entirely flavous, the first convex, coarsely and evenly punctate, not discrete from the apically truncate clypeus; mandibles not large, apically infuscate. *Antennæ* filiform and shortly pilose, black, with the scape flavous beneath. *Thorax* stout and broader than the head; mesonotum shining and very finely punctate and pilose, black, with large elongate callosities before and a line beneath radix, as well as a triangular mark on the mesopleuræ, bright flavous; notauli somewhat deeply impressed; metathorax subglabrous and nitidulous, with all the areæ (except the basal area) well-defined; areola twice as long as broad and nearly parallel-sided, emitting costulæ much before its centre; petiolar area

Fig. 76.—*Exochus xanthopus*, Cam.

short, entire and basally strong. *Scutellum*, postscutellum, and both freni flavous. *Abdomen* elongate-fusiform, immaculate black, finely punctulate and pilose throughout; basal segment strongly margined laterally and discally bicarinate to near its apex; venter and the elongate ventral valvulæ piceous. *Legs* bright flavous, with only the pulvilli, hind coxæ, and basal joint of their trochanters black; posterior calcaria very unequal in length, with the inner hind calcar distinctly shorter than the apical width of its tibia. *Wings* hyaline and not broad; radix and tegulæ flavous, stigma infuscate, nervures brownish; upper basal by no means continuous with the lower; nervellus subopposite and intercepted distinctly below its centre.

Length 7 millim.

PUNJAB: Simla, v. 97 (*Col. Nurse*).

Type in Col. Nurse's collection.

The above description has been drawn from the type.

209. **Exochus parca**, sp. n.

♂ ♀. A black and shining species, with no flavous markings. *Head* hardly narrower than thorax, and constricted behind the internally unemarginate eyes; occiput subconcave and abruptly declivous; frons finely punctulate, centrally convex but not carinate; face convex, finely and evenly punctate, and not discrete from the apically broadly rounded clypeus, of ♂ testaceous below the scapes; palpi and the weak mandibles flavous. *Antennæ* filiform, apically subattenuate and a little shorter than the body; black, with the scape testaceous beneath. *Thorax* not very stout, subcylindrical; mesonotum dull, densely pilose and closely punctulate, with the notauli not short; metathorax subglabrous, with strong carinæ; areola parallel-sided, thrice as long as broad, apically truncate and entire, emitting costulæ from its centre; petiolar area entire and gradually declivous; spiracles elongate and not small. *Scutellum* punctulate and black. *Abdomen* elongate-fusiform, immaculate-black, finely punctulate and pilose throughout; basal segment strongly margined laterally and discally bicarinate to near its centre; venter testaceous, terebra black and subexserted; ♂ genital valvulæ pale and elongately extruded. *Legs* testaceous-red, with only the claws and pulvilli black; intermediate calcaria equal, the hind ones strongly unequal, in length. *Wings* hyaline and not broad; radix and tegulæ flavous, stigma piceous, nervures brunneous; upper basal by no means continuous with the lower; nervellus antefurcal and intercepted near its lower angle.

Length 5½ millim.

PUNJAB: Kangra Valley, 4500 ft., iv. 99 (*G. C. Dudgeon*); ASSAM: Shillong, 6000 ft., v. 03 (*Rowland Turner*, type); CEYLON (*Thwaites*—Oxf. Mus.).

Type ♀ in the British Museum.

I have seen three males and three females of this species.

210. **Exochus coronellus**, sp. n.

♂. A black and flavous species, with the thorax tricoloured.

Fig. 77.
Exochus coronellus, Morl.

Head short and hardly narrowed behind the internally broadly emarginate eyes; occiput concave and abruptly declivous; frons finely punctulate and centrally convex, with no carinæ; head flavous, with only the occiput and ocellar region to scrobes black; face convex, pilose and hardly discrete from the apically rounded clypeus. *Antennæ* pilose, filiform and not attenuate apically, much shorter than the body, black, with the scape flavous beneath. *Thorax* stout, a little broader than the head; mesonotum pilose

and not very shining, punctulate, black, with the superficial notauli and a broad central vitta flavescent. becoming centrally red; mesopleuræ flavous, with a basal fascia and a broad line below radices black; mesosternum testaceous, with the interpectoral sulcus black; metathorax glabrous and rufescent, with its base punctulate and black; areola strong to the conspicuous costulæ, thence all areæ are wanting. The convex and punctate *scutellum*, its frenum and the postscutellum flavous. *Abdomen* elongate-fusiform, broader behind centre, punctulate, pilose, black, with apices of all the segments badious, or red, with base of the basal three nigrescent; basal segment strongly margined laterally, and discally bicarinate only at its base; venter piceous. *Legs* bright stramineous, with only the pulvilli and sometimes the hind trochanters blackish, hind coxæ and their tarsi reddish; posterior calcaria very unequal in length. *Wings* hyaline and not broad, radix and tegulæ flavous, stigma and nervures piceous; basal nervures subcontinuous; nervellus antefurcal and intercepted at its lower angle.

Length 5 millim.

ASSAM: Shillong, 6000 ft., v.03 (*Rowland Turner*).

Type in the British Museum.

Allied to the variety of *Exochus coronatus*, Grav., described by Thomson (Deut. Ent. Zeit. 1887, p. 211), but much more profusely pale-marked, with the petiolar carinæ shorter, nervellus intercepted lower, etc.

Only two males of this beautiful species are known to me.

211. **Exochus flavicaput**, sp. n.

♂. A nitidulous black species with the head (except posteriorly), mesothorax broadly, scutellum and legs, bright flavous; hind coxæ black; basal nervure not continuous.

So similar is this insect to the last species that I am able to differentiate them satisfactorily only by the metanotal areæ and alar neuration; from *E. coronellus* the present differs in having no rufescent thoracic markings, the lateral sutures (but not the disc) of the mesonotum broadly flavous, the mesopleuræ only centrally concolorous and the mesosternum immaculate black; the metathorax is entirely black, with only the basal lateral areæ punctate, all the areæ entire with the areola apically strong, both lateral carinæ present and the petiolar area discrete; the abdomen is entirely black above with its basal segment bicarinate to the centre; the legs are bright stramineous with only the pulvilli and whole of the hind coxæ and trochanters black; the nervellus is similarly intercepted, but the basal nervure of the front wing is very distinctly postfurcal and for some distance merged in the median; and the size is distinctly larger.

Length 7 millim.

SIKKIM: Darjiling, 6000 ft., ix. 08 (*E. Brunetti*).

Type in the Indian Museum.

I am quite prepared to find it a well-known Palæarctic species; but it is unknown to me and I cannot reconcile it with any of Holmgren's or Thomson's descriptions. Described from a single example.

212. **Exochus flavinotum**, sp. n.

♀. A nitidulous black species, with the head (except posteriorly and at the upper external orbits), mesothorax broadly and discally, scutellum, and whole legs, bright flavous; head buccate; basal nervure not continuous.

Length 5½ millim.

Assam: Ukhrul, Manipur, 6400 ft. (*Rev. W. Pettigrew*).

Type in the Indian Museum.

At once recognised from the above two species by its posteriorly much broader head and more deplanate mesonotum, which bears a definite quadrate discal spot. I find no other distinctions of note.

Genus **POLYCLISTUS**, *Först.*

Polyclistus, Förster, Verh. pr. Rheinl. 1868, p. 161; Thomson, Deut. Ent. Zeit. 1887, p. 217.
Metacoelus, Holmgren (*nec* Först.), Öfv. 1873, p. 61.

Genotype, *Ichneumon mansuetor*, Grav.

Head laterally almost semiglobose, vertex narrow and abruptly declivous behind the internally not emarginate eyes, occiput subexavate; frons densely and finely punctate, with the scrobes distinct, though neither elongate nor deeply impressed; cheeks long, but not sulcate; face densely and very finely punctate, strongly protuberant below the scrobes. Antennæ somewhat short, stout, apically attenuate, with the ♂ flagellar joints elongate. Thorax with pronotum glabrous and metathoracic costulæ strong. Basal abdominal segment strongly constricted basally, with the carinæ long and stout; the three or four following segments laterally margined beyond the centre; the second transverse and, like the following, densely and evenly punctate. Legs stout, but with the anterior tarsi less strongly dilated than the hind ones; intermediate tibiæ with calcaria of equal length. Wings with the stigma somewhat broad, nervulus postfurcal and the lower angle of the discoidal cell somewhat acute.

Range. Europe, Himalayas, United States.

The above is Thomson's definition of this genus, which he says differs from *Exochus* in its more prominent face, immaculate black face and vertex, abruptly declivous occiput, and more strongly narrowed base of the petiole. In practice, however, I have simply followed Förster's meagre definition, regarding those species possessing two central metanotal areæ as pertaining to *Exochus*, and those with three as falling into the present genus.

It appears to me that Holmgren, Förster, and Thomson all described different genera; and *Polyclistus* were, perhaps, better merged in *Exochus* if the name had not already been frequently cited, especially by systematists.

Table of Species.

1 (2) Head, thorax, and scutellum broadly marked with flavous	*appendiculatus*, Cam.
2 (1) Head, thorax, and scutellum immaculate black ....,	*erythropus*, Cam.

213. **Polyclistus appendiculatus**, *Cam.*

Exochus appendiculatus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1902, p. 430 (♀).

♀. A small, shining black, flavous-marked species. *Head* as broad as thorax, broadly narrowed behind the internally slightly emarginate eyes; occiput glabrous, abruptly declivous and deplanate; frons finely punctulate, evenly convex and pilose throughout, with scrobes distinct but cristulæ wanting; face strongly protuberant, evenly convex and coarsely punctate, not discrete from the apically margined and truncate clypeus; face, mouth (except base and apex of mandibles), cheeks, frontal orbits and a large triangular dot at vertical orbits, flavous. *Antennæ* filiform, somewhat shorter than body, obsoletely pilose, the scape with a flavous mark beneath. *Thorax* subcylindrical and black, with an elongate flavous callosity before radices; mesonotum pilose and coarsely, though not very closely, punctulate; notauli punctiform; metanotum glabrous and discally deplanate, with complete areæ; basal area quadrate; areola hexagonal and a little longer than broad, emitting costulæ near its base; petiolar area not vertical, short, entire and basally strong. *Scutellum* at sides and apex, its frenum and whole of postscutellum, flavous. *Abdomen* nitidulous, punctate and pilose throughout; two basal segments laterally margined, the first laterally a little explanate throughout, with the disc bicarinate only on its basal third; venter and the basally concealed terebra piceous. *Legs* stramineous; anterior pairs with pulvilli and extreme base of coxæ infuscate: hind ones with coxæ, trochanters and extreme base of femora black; posterior calcaria very unequal in length, the outer intermediate being particularly short. *Wings* hyaline and not broad; areolet wanting: radix and tegulæ flavous, stigma narrow and piceous; basal nervure subcontinuous; nervellus nearly antefurcal and intercepted near its lower angle.

Length 5 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

I have seen only the type.

214. **Polyclistus erythropus**, *Cam.*

Exochus erythropus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1902, p. 423 (♀).

♀. A shining black species, with only the legs, mouth and scape pale. *Head* narrower than thorax and abruptly constricted behind the internally slightly emarginate eyes; occiput abruptly sloping and a little concave; frons finely punctulate, centrally convex, with no carinæ; face strongly protuberant, evenly convex and finely punctate, red beneath the scrobes and not discrete from the apically immarginate and truncate clypeus; mandibles weak, rufescent, with their apices hardly darker, palpi flavescent. *Antennæ* somewhat shorter than the body, setaceous, with the flagellar joints apically subnodulous, black, with the scape entirely testaceous. *Thorax* stout and immaculate black; mesonotum distinctly and not very finely punctate and pilose, with notauli elongate; metanotum obsoletely punctate, with complete areæ; basal area minute and subcircular; areola parallel-sided, twice as long as broad, apically rectangular and basally curved, emitting costulæ a little before its centre; petiolar area subvertical, entire and basally strong; spiracles elongate and not small. *Scutellum* finely punctate and immaculate. *Abdomen* nitidulous, punctate and pilose throughout; two basal segments laterally margined, the first laterally a little explanate throughout, with the disc bicarinate to its centre; venter piceous, terebra slightly exserted. *Legs* entirely testaceous, with only the claws and pulvilli infuscate; intermediate calcaria equal, hind ones unequal. *Wings* hyaline and not broad; areolet wanting; radix and tegulæ testaceous, stigma piceous; basal nervure hardly continuous; nervellus nearly antefurcal and intercepted near its lower angle.

Fig. 78.
Polyclistus erythropus, Cam.

Length 6 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

The only example I have seen, besides the type, is in the Oxford Museum; it is labelled "India, Boys," and is remarkable in having a well-defined areolet in the left wing and no trace of one in the right.

Genus TRICLISTUS, *Först.*

Triclistus, Förster, Verh. pr. Rheinl. 1868, p. 161.

GENOTYPE, *Exochus podagricus*, Grav.

Head more or less strongly buccate, with the frons impressed on either side and in the centre carinate between the antennæ,

often sulcate before the ocelli ; vertex elevated and the very prominent face strongly punctate ; mandibles deplanate and basally broad ; eyes oblong, externally slightly sinuate and internally somewhat emarginate next the scrobes. Flagellum a little attenuate basally, with its first joint cylindrical. Metathoracic spiracles circular, and the sternum basally bifid between the intermediate coxæ. Abdomen smooth and nitidulous ; apical ventral segment of ♀ broad and apically emarginate, entirely concealing the terebra and sometimes extending to the apex of abdomen. Femora strongly incrassate ; hind calcaria somewhat stout, with the internal calcar nearly half the length of the metatarsus. Areolet entire, rarely with its external nervure pellucid, and generally shortly petiolate.

Range. Europe, India, Burma, Ceylon, and North America.

This genus is distinguished by having a more or less distinct areolet, the areola and central lateral metanotal areæ not discrete, the nervellus intercepted at its basal third, the second abdominal segment not discally carinate, the basal flagellar joint distinctly longer than the second, and the abdomen sessile, with the spiracles of its basal segment somewhat before the centre.

Cameron appears to have used the genus *Exochus* in its older and broader sense, with the result that it is now difficult to assign to their more modern genera the insects set out in his earlier descriptions.

Table of Species.

1 (6) Face and frontal orbits immaculate.	
2 (3) Abdomen entirely red	*dimidiatus*, sp. n., p. 301.
3 (2) Abdomen entirely black.	
4 (5) Areola slightly longer than broad ; length 7 millim.	*aitkeni*, Cam., p. 302.
5 (4) Areola twice as long as broad ; length 4 millim.	*curvicarinatus*, Cam., [p. 303.
6 (1) Entire face and frontal orbits pale ..	*pallidifrons*, sp. n., p. 304.

215. **Triclistus dimidiatus**, sp. n.

♀. A conspicuous red species, with the head and thorax black. *Head* immaculate and not strongly constricted behind the internally broadly emarginate eyes ; occiput abruptly sloping and bordered below ; vertex narrow ; frons distinctly and sparsely punctate, apically produced into a longitudinal horn between the distinct scrobes ; mouth-parts partly rufescent. *Antennæ* filiform and a little longer than half the body, dull fulvous, becoming paler basally, with the scape flavescent. *Thorax* black, evenly punctate and nitidulous ; notauli wanting ; mesonotum apically produced ; all the pleuræ absolutely glabrous and strongly nitidulous ; metanotum obsoletely punctate, with the petiolar area very short and basally entire ; areola parallel-sided, fully twice as long as broad, with no costulæ, but the carinæ both above and below the

large ovate spiracles distinct. *Scutellum* black, subdeplanate, sparsely punctate and with brown hairs, with no lateral margin. *Abdomen* bright brick-red, cylindrical, subdeplanate and a little longer than head and thorax, nitidulous and somewhat closely punctate, with fulvescent hairs; basal segment paler, gradually dilated throughout, not half as long again as apically broad, with its apically glabrous disc weakly bicarinate from base to centre; terebra not exserted. *Legs* very stout and luteous, with the hind femora red, their tibiæ apically and (probably) the whole hind tarsi black. *Wings* ample, with the radix and tegulæ flavescent, stigma piceous; areolet entire, oblique and petiolate; basal nervure strongly sinuate and elongately merged in the median.

Length $7\frac{1}{2}$ millim.

BURMA: Karen Hills, 3000–3700 ft. (*L. Fea*).

Type in the Genoa Civic Museum.

The abdominal colour is distinctive. I have seen only a single specimen.

216. **Triclistus aitkeni**, *Cam.* (emend.).

Exochus aitkini, Cameron,* Manch. Mem. 1897, p. 31 (♂).

A black species, with the legs, except the hind coxæ and tarsi, stramineous. *Head* nitidulous and closely covered with short black hairs; face closely and somewhat strongly punctate above, frons semicircularly canaliculate beyond the ocelli; palpi flavescent, and mandibles piceous before their apices. *Antennæ* with short infuscate pubescence and the flagellum, especially basally, piceous. *Thorax* with sparse infuscate pubescence, pleuræ glabrous and nitidulous; metanotum fully areated, the areola slightly longer than broad, dilated to shortly beyond its centre and thence narrowed to the truncate apex; metapleuræ apically shagreened and sinuately carinate above the spiracles. *Abdomen* with the first segment basally depressed, the depression margined, and the margin continued shortly beyond it as blunt keels, apically obscurely punctured. *Legs* stramineous, with the hind coxæ and tarsi black. *Wings* hyaline, with the stigma infuscate; areolet minute, elongately petiolate and not much broader than the submarginal

Fig. 79.
Triclistus aitkeni, Cam.

nervure, its outer nervure pellucid and continuous with the second recurrent.

Length 7 millim.

BENGAL (*E. H. Aitken*).†

Type in the Oxford Museum.

I have seen only the type.

217. **Triclistus curvicarinatus**, *Cam.*

Exochus curvicarinatus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1902, p. 431 (♀).

♀. A black and shining species, with no flavous markings. *Head* broadly rounded behind the internally distinctly emarginate eyes; occiput subvertical and bordered below; frons finely punctulate, strongly carinate centrally; face convex, coarsely and sparsely punctate, and not discrete from the apically truncate clypeus; mandibles strong and apically rufescent; ligula fulvous, palpi flavous. *Antennæ* filiform, much shorter than the body and with white hairs, fulvous throughout, with the scape and base of flagellum hardly paler beneath. *Thorax* stout and slightly broader than the head; mesonotum shining and distinctly, though not very closely, punctate and pilose; notauli distinct and punctiform; metathorax subglabrous and nitidulous, with all the areæ (except the basal area) well-defined; areola nearly twice as long as centrally broad, subhexagonal, emitting costulæ from its centre; petiolar area short, entire and basally strong. *Scutellum* punctate and immaculate. *Abdomen* nearly parallel-sided, immaculate black, finely punctulate and pilose throughout; basal segment laterally subimmarginate, and discally bicarinate only to its centre; venter, pygidium and the subconcealed terebra piceous. *Legs* flavescent, with only the hind tarsi and the base of the coxæ subinfuscate; tibiæ, and apices of the intumescent front femora, stramineous; intermediate calcaria nearly equal in length, the hind ones very unequal, with the outer calcar apically obliquely truncate and somewhat shorter than the apical width of their tibiæ. *Wings* hyaline and not broad; radix and tegulæ flavous, stigma piceous; upper basal by no means continuous with the lower basal nervure; areolet externally continuous with the second recurrent nervure, minute, obliquely quadrate and elongately petiolate, with its outer nervure, like the whole upper

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half of the recurrent, fenestrate; nervellus antefurcal and indistinctly intercepted far below its centre.

Length 4 millim.

BOMBAY: Deesa, x. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

I have seen only the typical female.

218. **Triclistus pallidifrons**, sp. n.

♀. A small black species with the eyes, face and base of antennæ unicolorous flavous. *Head* entirely testaceous below the antennæ, with the frontal orbits anteriorly concolorous. *Antennæ* stout and flavescent, becoming testaceous centrally and infuscate apically. *Thorax*: metathoracic costulæ wanting and the petiolar area somewhat short. *Legs*: hind calcaria not longer than half the metatarsus nor than the apical breadth of the tibia. *Wings* hyaline, with the radix and tegulæ flavous; radius of upper wings emitted from centre of the broad stigma; lower basal nervure elongately postfurcal and areolet subpetiolate.

Fig. 80.
Triclistus pallidifrons, Morl.

Length 4 millim.

CEYLON (*Dr. Thwaites*).

Type in the British Museum.

This species is very closely allied to *T. pallidipes*, Holmg. (Öfv. 1873, p. 59), but the pale face and frontal orbits instantly distinguish it.

Genus **MEGATREMA.**

Megatrema, Cameron, Zeits. Hym.-Dip. 1907, p. 468.

GENOTYPE, *M. albopilosa*, Cam.

Clypeus not discrete; cheeks distinct; mandibles broad and equally bidentate; vertex not apically carinate; temples short, sharply and obliquely constricted; ocelli in a curve, with the basal ones twice as far from each other as from the eyes. Basal flagellar joint longer than the second. Mesonotum and scutellum deplanate; metanotal areola stoutly carinate, its basal half parallel-sided, its apex subcircular, enclosing two slender and convergent carinæ; spiracles very large, oval and more than twice as long as centrally broad; lateral carinæ extending to a deeply impressed pyriform area; "the sides of the metanotum at the middle are roundly curved inwardly." Abdominal segments with no carinæ; the basal sessile, as long as basally broad, with its spiracles at the base. Legs stout, with the apical joint of the front tarsi large and

dilated; hind tibiæ elongately bicalcarate, with the larger extending beyond centre of metatarsus. Areolet small, triangular and petiolate, emitting the second recurrent from its apex; upper continuous with lower basal nervure; stigma somewhat elongate and not much broader than costa, emitting radius from apex of its basal third; nervellus distinctly angled and intercepted at it lower fourth.

Range. Sikkim.

This genus is said to be easily recognised by its very large and elongate metathoracic spiracles.

219. **Megatrema albopilosa,** *Cam.*

Megatrema albopilosa, Cameron, Zeits. Hym.-Dip. 1907, p. 469 (♂).

A smooth black shining species, with dense white pubescence, and the greater part of the antennæ and anterior legs red. *Head* with face and clypeus densely punctate and with long dense pubescence; frons and vertex more closely and finely punctate. *Antennæ* with the fourteen basal joints red. *Thorax* with the mesonotum sparsely but distinctly punctate, its basal impression stoutly bicarinate on either side; pleuræ punctate and with long white hairs; metanotum basally glabrous, with the petiolar area strongly and irregularly punctate, its apex centrally elevated, finely strigose and circularly incised. *Scutellum* sparsely and not strongly, though distinctly, punctate. *Abdomen* double the length of the thorax, with its apical segments bluntly pointed and with dense black hairs. *Legs* black, with the anterior trochanters, femora, tibiæ, and tarsi red; all the calcaria white; tibiæ and tarsi densely, femora more sparsely, white pilose. *Wings* hyaline to the basal nervure, thence infumate, with a violet tinge; nervures and stigma black; hind wings hyaline, with their apices but slightly and narrowly infumate.

Length 13 millim.

SIKKIM (*Col. Bingham*).

Unknown to me.

Genus **COLPOTROCHIA,** *Holmg.*

Colpotrochia, Holmgren, Sv. Ak. Handl. 1854, p. 80.
Inoresa, Cameron, Journ. Bombay Nat. Hist. Soc. 1909, p. 724.

GENOTYPE, *Ichneumon elegantulus,* Schrank.

Head transverse, with the vertex rounded; face somewhat convex and subprotuberant; clypeus not discrete; mandibles basally broad, convexly constricted apically, with the teeth subequal in length; eyes oblong and distinctly emarginate next the antennæ. Antennæ stout and filiform, with their apices attenuate; not or hardly shorter than the body. Thorax stout; metathorax with spiracles elongate and parallel-sided; metanotal areæ wanting, with but indications of a minute basal area. Abdomen ovate-subfusiform, subsessile, nitidulous and pilose; first segment gradually

constricted basally, inconspicuously bicarinate before its centre, where are the spiracles; terebra concealed and hardly extending to anus. Areolet wanting; radius and second recurrent nervures strongly sinuate; nervellus intercepted below its centre. Legs stout, with the femora incrassate.

Range. Europe, Punjab, Assam.

The lack of an areolet and of any distinct basal metanotal areæ, coupled with the subsessile abdomen, will instantly distinguish this conspicuous genus. The type of that recently erected by Cameron agrees to a remarkable extent with the common European *Colpotrochia elegantula*, Schr., and it is obvious that he did not know the present genus.

Table of Species.

1 (2) Frons closely punctate; scutellum and abdomen red .... *melanosoma*, sp. n.
2 (1) Frons sparsely punctate; scutellum and abdomen flavous .... *pilosa*, Cam.

220. Colpotrochia melanosoma, sp. n.

♀. A handsome black species, with rich red markings. *Head* black and obliquely constricted behind the internally slightly emarginate eyes, which do not extend to the base of the mandibles; occiput and frons closely punctate, with the latter strongly carinate between the scrobes; face strongly and evenly punctate, with griseous pilosity, not impressed nor discrete from the apically broadly rounded clypeus; palpi and the centre of the evenly bidendate mandibles testaceous. *Antennæ* not shorter than the body, black, strongly attenuate, with the scape entirely and the flagellum beneath testaceous; all the joints very short, with the first flagellar hardly longer than the second. *Thorax* much broader than head, black, and with long grey hairs; mesonotum nitidulous, sparsely and finely punctulate, hardly produced apically, with no notauli; mesopleuræ nitidulous and distinctly punctate; metathorax very finely punctate, lateral carinæ distinct both above and below the very elongate spiracles; basal area minute, triangular and subcomplete; petiolar wanting, longitudinally tricarinate apically and not produced. *Scutellum* not large, nitidulous and subdeplanate, deep red, with its long pilosity and transverse postscutellum concolorous. *Abdomen* distinctly longer than, and apically nearly as broad as, head and thorax, very strongly nitidulous, with the

Fig. 81.
Colpotrochia melanosoma, Morl.

central segments glabrous; finely pilose and deep black, the apical half of the two basal segments and the third, except in centre of its base, deep red; hypopygium apically truncate, rufescent and covering the base of the concolorous terebra. *Legs* short and stout, black, with the anterior tarsi, the front and base of intermediate tibiæ and the front femora, except at their base, testaceous; hind tibiæ broadly rufo-testaceous centrally; pulvilli elongate, claws simple. *Wings* testaceous-hyaline, with the costa, stigma, radix, and tegulæ testaceous; nervures blackish.

Length 11–12 millim.

ASSAM: Shillong, 6000 ft., iv. and ix. 03 (*Rowland Turner*).

Type in the British Museum.

The abdomen varies both in the length of the petiolar carinæ, which in the type are simply basal, but in the larger specimen extend beyond the centre, and in coloration, since in the latter both base and apex of the second segment, merely the apex of the first, the whole of the third, and the sides of the fourth laterally, are red.

221. **Colpotrochia pilosa**, *Cam.*

Inoresa pilosa, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 724 (♀ as ♂).

♀. A handsome black and flavous species, with the flagellum, stigma, and hind femora red. *Head* black and somewhat constricted behind the internally emarginate eyes, which extend to base of mandibles; occiput and frons sparsely and obsoletely punctate, with the latter strongly carinate between the scrobes; face strongly and evenly punctate and with white hairs throughout, not impressed, nor discrete from the small and apically truncate clypeus; mandibles and palpi flavescent, with apices of former black. *Antennæ* flavous, with the flagellum ferruginous above and apically; all the joints very short, the first about half as long again as second; scape not strongly excised. *Thorax* black, with callosities before radices, the metapleuræ narrowly at their base, and the apical two-thirds of the metanotum, flavous; mesonotum with grey hairs and shagreened, apically subacuminate, with no notauli; mesopleuræ nitidulous and distinctly punctate; metathorax basally and laterally black and very finely punctate; lateral carinæ distinct both above and below the strongly elongate spiracles; basal area minute and incomplete; petiolar area wanting, apically longitudinally tricarinate and subproduced on either side of the petiole. *Scutellum* not large, nitidulous and subdeplanate, flavous, with its elongate pilosity and transverse postscutellum concolorous. *Abdomen* half as long again, though not broader than, head and thorax, somewhat nitidulous, closely punctulate and strongly pilose, black, with the three basal segments broadly flavous at their apices both above and below; apical margin of fourth segment obsoletely rufescent; hypopygium apically truncate, not extending to base of the rufescent terebra. *Legs* short and stout, flavous

and with white hairs, the apices of the hind femora and tibiæ blackish; pulvilli elongate, claws simple. *Wings* flavescent-hyaline, with the costa, stigma and radix testaceous, the tegulæ flavous, and the nervures blackish.

Length 12 millim.

PUNJAB: Simla (*Col. Nurse*); BOMBAY, Karachi (*T. R. Bell*).

Type in Col. Nurse's collection.

Besides its larger size and distinctive coloration, this species appears to differ from the remainder of its congeners in the transverse postscutellum, which in the typical *C. elegantula*, Schr., is quadrate.

Mr. Bell's specimen was bred from a nest of a wasp, *Eumenes esuriens*, F.

Genus **HYPERACMUS**, *Holmg.*

Hyperacmus, Holmgren, Sv. Ak. Handl. 1855, p. 322.
Nothaima, Cameron, Journ. Bombay Nat. Hist. Soc. 1902, p. 428.

GENOTYPE, *Exochus crassicornis*, Grav.

Head transverse, with the vertex emarginate and the face strongly protuberant; inter-antennal carina entirely wanting; clypeus deplanate and but obsoletely discrete; eyes not emarginate. Antennæ stout, with the scape subcylindrical: flagellum filiform, of ♂ as long as the body and apically attenuate, with the joints elongate and the fifth basally emarginate; of ♀ short, with the joints subtransverse and externally subdenticulate. Thorax deplanate, with the epomiæ wanting and epicnemia entire; notauli very distinct and extending to centre of mesonotum; metathorax somewhat convex and rugulose, with obvious longitudinal, but no transverse, costæ; petiolar area subobsolete. Abdomen of ♀ oblong-ovate, of ♂ subcylindrical; basal segment rugulose, gradually constricted basally and laterally emarginate, with the spiracles slightly before the centre; remaining segments transverse and nitidulous. Legs subincrassate and not very short, with the tibiæ externally setiferous and the calcaria curved. Wings narrow and somewhat elongate; areolet wanting; nervellus intercepted below its centre.

Range. North and Central Europe, Himalayas, Connecticut.

The strongly deplanate and nitidulous mesothorax and abdomen, and the peculiar conformation of the antennæ in both sexes, will serve instantly to distinguish this genus. No male was assigned to it till 1871, when Brischke discovered that sex in Prussia.

In its deeply impressed notauli, longitudinally carinate metanotum and the excised antennæ of the male there would appear to be some connection with the Pimplid genus *Lampronota*, though the legs are very much stouter, the head anteriorly prominent and the terebra of the female is not exserted.

222. **Hyperacmus crassicornis**, *Grav.*

Exochus crassicornis, Gravenhorst, Ich. Eur. ii, 1829, p. 347 (♀).
Hyperacmus crassicornis, Holmgren, Sv. Ak. Handl. 1855, p. 322 (♀); Brischke, Schr. phys. ökon. Ges. Königsb. 1871, p. 101; Brischke, Schr. Nat. Ges. Danz. 1878, p. 108; Thomson, Deut. Ent. Zeit. 1887, p. 199 (♂ ♀).
Nothaima bicarinata, Cameron,* Journ. Bombay Nat. Hist. Soc. 1902, p. 428 (♂).

♂ ♀. A strongly shining black species, with the palpi pale, the mouth, underside of antennæ and most of the legs castaneous. *Head* somewhat tumidulous, with the vertex emarginate and the strongly protuberant face smooth or but sparsely punctulate; frons somewhat convex, punctulate, and centrally canaliculate. *Thorax* stout and deplanate; metathorax scabriculous, with two longitudinal discal carinæ, extending from base to apex; spiracles not small, longer than broad but not parallel-sided. *Scutellum* subglabrous and nitidulous, immaculate. *Abdomen* black or sometimes mainly badious, of ♀ hardly and in ♂ distinctly longer than head and thorax; basal segment laterally nearly straight, dorsally scabriculous, with weak basal carinæ extending to the spiracles, which are a little before the centre and not prominent; remaining segments strongly shining. *Legs* piceous or castaneous, with the anterior pairs paler, especially in ♂; all the coxæ and the hind trochanters black. *Wings* hyaline, with the tegulæ, radius, and stigma piceous; radial cell somewhat narrow.

Fig. 82.
Hyperacmus crassicornis, Grav.

Length 7–9 millim.

PUNJAB, Simla (*Col. Nurse*); UNITED PROVINCES: Mussoori, 7000 ft., vi. 05 (*E. Brunetti*—Ind. Mus.). EUROPE.

Type in the Breslau Museum; the type of Cameron's species in Col. Nurse's collection.

An examination of Cameron's type has enabled me unhesitatingly to synonymise it with Gravenhorst's species, which has been known in Central Europe since 1829, though apparently rare both there and in Sweden. It was not recognised as British till 1882; and its occurrence in the Himalayas indicates how little we yet know of the distribution of the ICHNEUMONIDÆ.

Genus **SETICORNUTA**, gen. nov.

Genotype, *S. albicalcar*, Morl.

Head narrower than thorax and strongly constricted posteriorly; frons and vertex obsoletely punctate and shining; face strongly protuberant, uniformly coarsely punctate and continuous with the hardly smoother clypeus; mandibles parallel-sided and longitudinally striate; eyes emarginate next the scrobes. Antennæ but little longer than half the body; scape strongly punctate and very little excised; flagellum peculiarly setiform and basally stout, consisting of some forty-five very strongly transverse joints, of which the apical are carinate beneath. Thorax deplanate, nitidulous and sparsely pilose; notauli superficial, though extending to the disc; mesopleuræ convex; metanotum strongly carinate at the apex and equally strongly bicarinate on the disc, rendering the quite circular areola and rather longer basal area conspicuous; costulæ wanting; spiracles elongate and occupying the whole space between the two lateral carinæ. Scutellum strongly deplanate, sparsely punctate and bordered only at its base. Abdomen convex; subparallel-sided and a little longer than the head and thorax, nitidulous and finely pubescent; first segment short, and centrally glabrous beyond the strongly bicarinate base, with basal spiracles; thyridii wanting; venter not concave; terebra hardly visible. Legs, and especially femora, short and stout, the hind tarsi extending to but slightly beyond the anus; calcaria unequal; claws small, curved, and not extending beyond the broad pulvilli. Wings ample, but not broad; areolet entire, small and petiolate, emitting the recurrent nervure from its apex; basal nervure continuous; nervellus antefurcal and geniculate at its lower third.

Range. Burma and Ceylon.

Somewhat resembling *Hyperacmus*, but unique in its flagellar conformation.

223. **Seticornuta albicalcar**, sp. n.

♀. A shining black species, with recumbent white hairs, rendering the body dull and lending it a kind of bloom. Scape entirely, the ten basal flagellar joints abruptly, the tegulæ, the front femora, tibiæ and their tarsi, bright fulvous; hind legs slightly badious; all the calcaria white; front wings densely infumate from the basal nervure, and the hind ones slightly towards their apices.

Length 13½ millim.

Fig. 83.
Seticornuta albicalcar, Morl.

Tenasserim: Mergui (*W. Doherty*, type); Ceylon: Kandy, vii. 10 (*O. S. Wickwar*).

Type in the Indian Museum.

The economy of this remarkable insect should prove peculiar and interesting, in connection with such remarkable organs of touch.

Tribe *TRYPHONIDES.*

Recent authors have subdivided this division, regarded by Holmgren as of equal rank with the Metopiides (his Aspidopi), Bassides (his Schizodonti) and Exochides (his Prosopi), into sections which they consider as distinct from each other as from Holmgren's other sections; but this I think incorrect. The whole conformation of the above four great divisions is so dissimilar that they are distinguishable at a glance, whereas the distinction between the Mesoleptini and Tryphonini is no more than the comparative sessility of the abdomen, and a distinct line cannot be drawn in this respect; these two differ from the Ctenopelmini solely in the absence of tarsal pectination; and all three are nearly indistinguishable from the Ctenicscini, excepting in the conformation of their calcaria; they have a common facies, and all, I believe, prey upon Sawflies. Hence I prefer to retain them under a common head, Homalopi or Tryphonides.

Table of Genera.

1	(30)	Head not apically constricted; wings of normal breadth.	
2	(21)	Tarsal claws simple, not pectinate beneath.	
3	(12)	Abdomen with basal segment more or less distinctly petiolate (Mesoleptini).	
4	(5)	Scutellum margined; abdominal segments large, apical hidden	Cryptodema, gen. nov., [p. 312.
5	(4)	Scutellum not margined; abdominal segments normal.	
6	(7)	Head discally quadrate and posteriorly as long as eyes	Perilissus, Holmg., [p. 314.
7	(6)	Head discally transverse and posteriorly shorter than eyes.	
8	(9)	Areolet wanting; submarginal nervure incrassate	Tilgida, Cam., p. 317.
9	(8)	Areolet entire; submarginal nervures not incrassate.	
10	(11)	Clypeus not discrete, nor antennæ pale-banded	Hypocryptus, Först., [p. 319.
11	(10)	Clypeus distinctly discrete; antennæ pale-banded	Euryproctus, Holmg., [p. 320.

12 (3) Abdomen with basal segment sessile, subsessile, or subpetiolate (TRYPHONINI).

13 (16) Abdomen subcylindrical; spiracles of 1st segment central.

14 (15) 2nd segment not impressed; areolet of normal size; body red-marked. . TRYPHON, Fln., p. 325.

15 (14) 2nd segment obliquely impressed; areolet large; body black . . . . DYSPETES, Först., p. 323.

16 (13) Abdomen subfusiform; spiracles of 1st segment before its centre.

17 (18) Areolet entire; wings distinctly infumate . . . . LABROSSYTA, Först., [p. 327.

18 (17) Areolet wanting; wings hyaline throughout.

19 (20) Notauli distinct and deep; metanotal areæ sometimes obsolete . . . . MESOLEIUS, Holmg., [p. 328.

20 (19) Notauli entirely wanting; metanotal areæ entire . . . . EXACRODUS, Först., [p. 330.

21 (2) Tarsal claws distinctly and often elongately pectinate (CTENOPELMINI).

22 (27) Abdomen with basal segment sessile or subsessile.

23 (26) Clypeus not transversely discrete from the face.

24 (25) Mandibular teeth subequal; basal metanotal areæ entire. . . . . MONOBLASTUS, Htg., [p. 331.

25 (24) Mandibular teeth unequal; metanotum with no areæ . . . . ICYONA, Cam., p. 333.

26 (23) Clypeus separated from face by transverse impression . . . . CTENACME, Först., p. 335.

27 (22) Abdomen with basal segment very distinctly petiolate.

28 (29) Head transverse; clypeus apically simple and subimpressed . . . . RHORUS, Först., p. 336.

29 (28) Head very broad; clypeus dentately produced centrally . . . . SCOLOBATES, Grav., [p. 338.

30 (1) Head strongly constricted to mouth; wings very narrow . . . . MEGASTYLUS, Schiöd., [p. 341.

Genus CRYPTODEMA, gen. nov.

GENOTYPE, *C. anormis*, Morl.

Head strongly transverse; mandibles equally bidentate; occiput entire and bordered below; clypeus centrally produced at apex; eyes internally straight and a little convergent below; frons produced between scrobes. Metathorax short, with the areola and petiolar area confluent. Scutellum margined throughout and not convex. Abdomen distinctly petiolate, with but three dorsally visible segments, the remainder entirely concealed; basal segment bicarinate, with the spiracles behind its centre; thyridia wanting. Posterior tibiæ elongately bicalcarate; femora edentate;

claws not pectinate. Areolet wanting; nervellus subantefurcal and intercepted below its centre.

Range. Bengal.

This remarkable genus appears to approach nearest to *Sphecophaga*, Westw. (*Cacotropa*, Först.) in the conformation of its legs, wings, mesonotum and petiolar spiracles, though differing in the produced clypeus, convex and carapace-like abdominal segments, bordered scutellum, and in the metanotal areæ. It has somewhat the facies of *Sphinctus* in its short metanotum, somewhat slender legs and produced clypeus; but the claws are simple and the very peculiar conformation of the abdomen seems to relate it in some degree to the Braconid Cryptogastres. Possibly it has Cryptid associations in the elongate petiole with spiracles behind the centre, but the former is not geniculate, while the metanotum is distinctly sculptured and the areolet obviously wanting. If related to *Sphecophaga*, its economy should be interesting, since that genus is known to prey upon *Vespa* in the midst of their nests (*cf.* my notes on the genus in Ent. Month. Mag. 1900, p. 117). There is no affinity whatever between this genus and *Hemigaster fasciatus*, as figured by Brullé (Nat. Hist. Ins. Hym. pl. xli, fig. 1, ♀), which has the terebra exserted to nearly half the length of the abdomen and the apical segments evident; though this differs somewhat widely from his description (*op. cit.* iv, p. 266) " il a la portion postérieure de l'abdomen repliée et cachée sous les trois premiers segments . . . . La tarrière est très-courte dans l'*H. fasciatus*."

224. **Cryptodema anormis**, sp. n.

♂. A dull black species, with testaceous markings and white pilosity. *Head* very broad and strongly transverse, coarsely and confluently punctate throughout; vertex very narrow, frons longitudinally carinate centrally and testaceous laterally; face longitudinally convex in the centre, testaceous and not discrete from the concolorous cheeks and clypeus, which latter is apically black and subspinously produced; mandibles stout and piceous, with their apices darker. *Antennæ* obsoletely pilose, nearly as long as the body, filiform, with the flagellum of about thirty elongate and cylindrical joints, those of the apical third subattenuate and more discrete; black, with the central nine joints and more or less of the scape dull testaceous. *Thorax* very stout, gibbous, not broader than the head, hardly longer than high, discally scabriculous and laterally finely punctate; mesonotum anteriorly vertical, with coarse recumbent hairs and distinct though short notauli; metanotum with the areola and postero-intermedial areæ testaceous, remainder black; areola confluent with both basal and petiolar areæ, emitting strong costulæ and long acuminate apophyses; spiracles obliquely linear and not large. *Scutellum* coarsely punctate and dull, feebly convex, black, with its lateral and apical margins carinate and, like the hardly

discrete postscutellum, flavous. *Abdomen* very strongly convex and quite ovate, dull, closely and evenly punctate throughout, black, with all the sides, base of the first and apices of the first three segments, testaceous; remaining segments entirely concealed beneath the laterally emarginate carapace of the third; basal segment laterally parallel-sided to centre and thence strongly dilated through the circular spiracles to the very broad apex, discally bicarinate throughout and laterally margined to the spiracles; venter entirely concave, testaceous and centrally plicate; ventral valvulæ large, piceous and emarginate subapically beneath, cerci distinct. *Legs* normal and somewhat slender, testaceous, with the base of the intermediate and whole of the hind coxæ, hind femora, apical half of their tibiæ, base of their tarsi, their calcaria and all the claws, black. *Wings* siliceous and ample; tegulæ flavous, radix testaceous, stigma blackish; basal nervure subcontinuous; second recurrent broadly fenestrate, and intercepting beyond the strongly curved inner nervure of the wanting areolet, beyond which the radius is abruptly sinuate.

Fig. 84.—*Cryptodema anormis*, Morl.

Length 10 millim.

Bengal: Buxar Duars, v. 07 (*D. Nowrojee*).

Type in the Pusa collection.

I have seen only a single example of this very remarkable species.

Genus **PERILISSUS**, *Holmg.*

Perilissus, Holmgren, Sv. Ak. Handl. 1854, p. 61; id. *op. cit.* 1855, p. 121.

Genotype, *P. filicornis*, Grav.

Head strongly buccate or subbuccate, with the temples broad and vertex subemarginate; clypeus usually more or less distinctly discrete basally; mandibular teeth of unequal length. Antennæ setaceous and often longer than the body, with the scape obovate and the basal flagellar joint always longer than the second. Upper metanotal areæ nearly always complete. Abdomen usually distinctly petiolate, oblong-ovate or subfusiform, laterally a little compressed in ♀ towards the apex; first segment either gradually narrowed basally or slightly constricted before the spiracles, with the discal carinæ and sulcus obsolete or wanting and the spiracles a little before its centre; terebra straight. Legs slender, with tarsal claws simple; hind calcaria of equal length and shorter than

their second tarsal joint. Wings somewhat ample; stigma of normal size; areolet sometimes entire, at others wanting.

Range. Palæarctic and Nearctic Regions.

At least one of the Indian species belongs to *Spanotecnus*, one of the subgenera into which Förster (Verh. pr. Rheinl. 1868, p. 197) split up this genus; though it does not altogether coincide with Thomson's definition of it (Opusc. Ent. ix, p. 911), where he says that the basal metanotal area is elongate, the mesopleuræ closely punctate, with smooth speculum, the abdomen at least centrally pale, notauli wanting, the frenal scrobes strongly discrete, epomiæ distinct though short, and the eyes small.

The members of *Perilissus* are known to prey upon sawflies.

Table of Species.

1 (2) Metathoracic areola entire; scutellum black .... *filicornis*, Grav.
2 (1) Metathoracic areola wanting; scutellum flavous *tricolor*, sp. n.

225. **Perilissus filicornis**, *Grav.*

Ichneumon filicornis, Gravenhorst, Mem. Ac. Sc. Torino, 1820, p. 368.
Mesoleptus filicornis, Gravenhorst, Ichn. Eur. ii, p. 94, excl. vars.; Stephens, Illus. Mand. vii, 1835, p. 227 (♂ ♀).
Perilissus filicornis, Holmgren, Sv. Ak. Handl. 1855, p. 121; Brischke, Schr. Nat. Ges. Danz. 1879, p. 71; Vollenhoven, Pinac. vii, pl. xxxiii, fig. 1 (♂ ♀).
Spanotecnus filicornis, Thomson, Opusc. Ent. ix, 1883, p. 911 (♂ ♀).

[A somewhat shining testaceous species, with the head and thorax black. *Head* closely and finely punctulate, posteriorly not at all constricted, almost broader than the eyes; frons deplanate and dull, usually with a shining line above the scrobes; face a little convex, very closely punctulate, black or more usually testaceous; clypeus not discrete, testaceous, sparsely punctate and apically rounded, with a fovea on either side; palpi and cheeks testaceous, the former with the three apical joints subequal in length; eyes somewhat small, oblong-ovate. *Antennæ* as long as the body, very slender and testaceous throughout. *Mesonotum* dull, with more or less distinct notauli; metathorax more shining, distinctly smoother and areated, with the basal lateral areæ subquadrate, basal area triangular, areola elongate, and the remainder smoother; spiracles linear.

Fig. 85.—*Perilissus filicornis*, Grav.

Scutellum a little convex, black. *Abdomen* testaceous, with the basal segment and sometimes the anus slightly infuscate, former

narrow, subconvex, slightly curved, with an obsolete discal sulcus; terebra not exserted. *Legs* slender, red, with the hind femora occasionally infuscate. *Wings* with the areolet triangular, entire and sessile, with the outer nervure weak, emitting the recurrent nervure beyond its centre; stigma and tegulæ flavescent-red: nervellus strongly postfurcal and intercepted a little above centre.

Length 10 millim.

Type in the Breslau Museum.]

Var. **orientalis**, nov.

Differs from the foregoing description in having the head much narrower and more constricted posteriorly, distinctly narrower than the eyes; in the somewhat stouter antennæ, more finely punctate mesonotum, lack of metanotal areæ, and in the petiolated areolet.

"INDIA" (*Capt. Boys*).

Type in the Oxford Museum.

The three specimens upon which the new variety is founded are so closely related to the Palæarctic type that I prefer to regard them as a local race, rather than a new species.

The typical form is abundant throughout nearly the whole of Europe, occurring in damp situations in the spring, and has been bred by Brischke in Prussia from two species of *Nematus*; in Britain it is of wide distribution and very common.

226. **Perilissus tricolor**, sp. n.

♂. A dull black species, with somewhat profuse red, and obsolete flavous, coloration. *Head* as broad as thorax, buccate behind the internally entire eyes, and black, with a large flavous spot at the base of the pilose face, another small one at the base of the hardly discrete clypeus, and the discally aciculate mandibles centrally rufescent; vertex very strongly emarginate, frons densely and evenly punctate; cheeks not short, nor eyes large. *Antennæ* slender, filiform and black, with apex of scape rufescent and apices of the flagellar joints subnodulose or setiferous. *Thorax* a little convex, black, with the prothorax and preradical lines obsoletely flavescent; metathorax dull and closely coriaceous, red, with only the base of the metanotum to the very strong costulæ black; notauli wanting; basal area quadrate and indistinct, petiolar area basally complete, very short, entire and strongly transverse; remaining areæ wanting; spiracles obliquely linear. *Scutellum* not margined, small, feebly convex, distinctly punctate and flavous; postscutellum concolorous. *Abdomen* fusiform, with basal segment narrow, parallel-sided, and the second strongly dilated throughout; black, with the third and fourth segments entirely, the second and fifth apically, red, the first obsoletely flavous at apex and a large anal spot flavous; ventral valvulæ large. *Legs* slender, elongate and red, with the anterior coxæ and trochanters flavous and black; tarsi, posterior tibiæ and trochanters,

the hind coxæ internally, and apices of their femora, black. *Wings* slightly clouded; areolet wanting, but with its outer and lower nervures traceable, though entirely fenestrate, and the inner continuous with the straight second recurrent; radius sinuate before apex: nervellus extremely strongly postfurcal and intercepted a little above its centre.

Length 9 millim.

Bengal: Pusa, iii. 07.

Type in the Pusa collection.

The lack of an areolet places this species in the subgenus *Spanotecnus*.

Genus **TILGIDA**, *Cam.*

Tilgida, Cameron, Manch. Mem. 1900, p. 108.

Genotype, *T. albitarsis*, Cam.

Eyes very large, with the inner orbits slightly but distinctly convergent below, vertical orbits striate; clypeus small, apically transverse and shorter than the labrum; mandibles curved, basally subtriangular, apically constricted and there obtusely bidentate; palpi somewhat elongate. Antennæ elongate, slender, and with a pale band. Thorax with pale markings; mesonotum with its discal depression extending beyond the centre to the strongly elevated apical lobe; metathorax elongate, evenly convex throughout, with no carinæ; spiracles oval and situated in a concavity halfway between the centre and apex. Scutellum large, roundly and but slightly convex. Abdomen elongate and slender; petiole long and neither stout nor apically curved; the first longer than the second segment, with spiracles small, circular and slightly beyond the centre; gastrocœli small and indistinct though distinctly and deeply impressed. Legs elongate and slender, with the hind coxæ large; tarsi spinose, with their claws curved, elongate and basally subincrassate; front tarsi basally sinuate, with their calcaria curved and pilose. Wings with no areolet; the single submarginal nervure incrassate and very short, one-fourth of the length between it and the emission of the second recurrent nervure; lower basal emitted from the median a little beyond the upper basal nervure.

Range. Assam.

This genus is at present known in the male sex alone.

Its author says (*loc. cit.*) "In the form of the abdomen it does not differ much from *Mesoleptus*,* but in other respects it differs completely from that and from any known genus of the Tryphonides. It is undoubtedly nearly related to *Baliena*, as is

* This must be accepted with reserve, since Cameron was at that time describing species of *Lissonota* (Pimplinæ) as *Mesoleptus*!—C. M.

shown by their agreement in the form of the head, thorax, and legs, but differs in the fore wings wanting the areolet," which feature must preclude it from the BANCHIDES. Dalla Torre was so much at a loss concerning its affinities that he places it among his very few "genera Ichneumonidarum sedis incertæ," though the lack of areolet, slender basal segment and subcentral petiolar spiracles appear to leave but little doubt respecting its right to inclusion in the TRYPHONINÆ, wherein the normal face and scutellum, bidentate mandibles, and lack of areolet preclude its position in any group but the TRYPHONIDES. The pale-banded antennæ remind one of *Euryproctus*, and it is its lack of distinctive features, not of abnormality, which renders it difficult to place. I do not for a moment anticipate stability for it, and an examination of the type inclines me to consider it allied to *Eugalta*, though our ignorance of the female renders such a position at present undesirable.

227. **Tilgida albitarsis**, *Cam.*

Tilgida albitarsis, Cameron,* Manch. Mem. 1900, p. 109 (♂).

♂. A black and slender species, with the antennæ and abdomen broadly pale-banded. *Head* black, with the face smooth, flavescent and with sparse white hairs; clypeus apically piceous and impressed, with somewhat long hairs; mandibles immaculate, palpi flavous. *Antennæ* black and basally flavescent beneath, with the scape and thirteenth to twenty-fifth flagellar joints entirely white. *Thorax*: pronotum basally flavous, propleuræ glabrous and broadly flavescent both above and beneath; mesonotum closely and strongly punctate, with the depressed apex obscurely strigose; mesopleuræ obscurely punctate and, in part, finely striate; mesosternum punctate; metathorax closely, somewhat strongly and transversely striate, and broadly sulcate longitudinally at its apex, which is flavescent and finely trans-striate; metapleuræ closely and obliquely strigose, with their base punctate. *Scutellum* flavous, with white pilosity, its punctures large and superficial; postscutellum smooth and flavous. *Abdomen* black, with all the segments apically broadly flavous; petiole

Fig. 86.—*Tilgida albitarsis*, Cam.

centrally deplanate and rugose, except at base; gastrocœli stramineous; four apical segments with dense white hair. *Legs* flavous, with the anterior tarsi blackish; hind legs fulvous, with the coxæ apically above, the trochanterellus above, apex of femora, nearly the apical half of tibiæ and the two apical tarsal joints, black. *Wings* hyaline.

Length 12 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Genus **HYPOCRYPTUS**, *Först.*

Hypocryptus, Förster, Verh. pr. Rheinl. 1868, p. 198.

GENOTYPE, *Mesoleptus testaceicornis*, Brischke.

Head transverse and posteriorly narrower than the eyes; clypeus impressed at apex and feebly rounded, basally not discrete; face not apically constricted; eyes convex and prominent; cheeks distinct and punctate. Antennæ slender and longer than the body; flagellum not incrassate. Mesonotum alutaceous and finely punctate; metathorax with complete areæ and circular spiracles. Scutellum alutaceous and finely punctate. Abdomen distinctly petiolate with the central segments not twice as broad as long, though transverse; postpetiole laterally carinate; terebra reaching apex of abdomen. Legs slender; hind femora not incrassate; apical hind tarsal joint distinctly shorter than the third; claws simple. Areolet entire and triangular. Body slender.

Range. Germany, Bengal.

The triangular areolet and very short terebra place the following species in the TRYPHONINÆ, though the general facies proclaim it to bear strong affinity with the Cryptid genus *Hemiteles*, and the structure of the legs is almost identical with that of *H. cingulator*, Grav. I have adopted the above genus for its reception with some hesitation, since Förster indicates no type, and it has hitherto only been used by Brischke (Schr. Nat. Ges. Danz. 1892, p. 337) for the ♂ of his *Mesoleptus testaceicornis*, from Germany, which I do not know.

223. **Hypocryptus cingulator**, sp. n.

♀. A small black Hemiteloid species, with the legs and centre of abdomen red. *Head* black and as broad as thorax, posteriorly broadly rounded and hardly narrowed behind the small and internally entire eyes; occiput bordered below; vertex pilose, finely punctate and not emarginate; frons and face subconvex, and evenly punctulate throughout; clypeus more sparsely punctate, obsoletely discrete and transversely impressed before its subtruncate apex; mandibles strong and rufescent, deeply punctate, with the lower tooth a little the longer. *Antennæ*

distinctly longer than the body, very slender and filiform, with the joints cylindrical, black, with scape entirely ferruginous. *Thorax* dull and very finely punctate, with the notauli obsolete; metanotum pilose, with complete areæ; basal area small, areola large and laterally rounded, with its apex truncate and central costulæ strong, petiolar area short and transverse; spiracles small and circular, apophyses wanting. *Scutellum* normal and black. *Abdomen* petiolate, fusiform, broadest in centre, obsoletely punctulate, black, with the apical half of the third and extreme apices of the second and fourth segments dull red; central segments transverse; first segment dilated to the distinct and central spiracles, thence parallel-sided and about as long as the breadth of the truncate apex, disc centrally subsulcate, with no carinæ, sides strongly margined from the spiracles; anus somewhat strongly compressed and hardly reaching the apex of the slender terebra. *Legs* elongate, very slender, red, with hind tarsi and apices of their tibiæ infuscate; hind calcaria white. *Wings* very ample, hyaline; stigma piceous and somewhat broad; tegulæ and radix rufescent; areolet triangular and subsessile, emitting the recurrent nervure from its centre; nervellus postfurcal and intercepted at its centre.

Fig. 87.—*Hypocryptus cingulator*, Morl.

Length 6 millim.

BENGAL: Pusa, iii. 06.

Type in the Pusa collection.

The type was captured on cauliflower leaves.

Genus **EURYPROCTUS**, *Holmg.*

Euryproctus, Holmgren, Sv. Ak. Handl. 1855, p. 109.
Fovaya, Cameron, Zeits. Hym.-Dip. 1903, p. 341.

GENOTYPE, *Ichneumon nemoralis*, Fourc.

Head transverse and not unusually buccate posteriorly, with the vertex emarginate; clypeus distinctly discrete basally, and not trans-impressed apically; mandibles subequal in length; eyes entire; face not strongly constricted apically, nor cheeks entirely glabrous. Antennæ white-banded, slender, filiform and nearly as long as the body; flagellum not incrassate. Thorax somewhat stout; mesonotum not distinctly punctate; metanotal areæ very

distinct; spiracles circular, not distinctly ovate. Basal segment slightly curved, with no discal sulcus, spiracles subcentral, petiole slender, post-petiole apically dilated, with no lateral carinæ; central abdominal segments not twice as broad as long; terebra straight and slightly exserted. Tarsi white-banded; hind femora not incrassate, the intermediate apically attenuate, with their tibiæ subsinuate. Basal nervure continuous through the median; areolet distinctly present.

Range. Palæarctic and Nearctic Regions.

No doubt can remain that Cameron's two species of his genus *Fovaya* are representatives of *Euryproctus*, since I have had an opportunity of examining the types of both in Col. Nurse's collection, and it is very obvious that their author was misled, in following Ashmead's tables, by the subbuccate head of these species, which, though transverse, is but very slightly constricted posteriorly.

The species of this genus are known to prey upon the larvæ of such TENTHREDINIDÆ as *Tenthredo*, *Eriocampa*, &c.

Table of Species.†

1 (2) Face and thorax with pale markings; anterior femora testaceous .... *annulicornis*, Cam.
2 (1) Face and thorax immaculate black; anterior femora mainly black .... *spinipes*, Cam.

229. **Euryproctus annulicornis**, *Cam.*

(?) *Euryproctus albipes*, Holmgren, Sv. Ak. Handl. 1855, p. 110 (♂); Thomson, Opusc. Ent. xiii, 1889, p. 1435; *op. cit* xix, 1894, p. 1985 (♂ ♀).
(?) *Euryproctus tuberculatus*, Holmgren, Sv. Ak. Handl. 1855, p. 111 (♀).
Fovaya annulicornis, Cameron,* Zeits. Hym.-Dip. 1903, p. 342 (♀, as ♂).

♀. A black flavous-marked species, with the abdomen centrally red, and the antennæ and hind tarsi pale-banded. *Head* black, with the sparsely and distinctly punctate clypeus, two indefinite marks before it on the alutaceous face, facial orbits, the striate mandibles (except apically), and the palpi, flavous; frons and vertex alutaceous. *Antennæ* slender and almost longer than the body, with the fourteenth to twenty-fourth joints entirely stramineous; scape with dense white pubescence beneath. *Thorax*

† Cameron's table (Ann. Nat. Hist. xx, p. 21) is very faulty. *Fovaya annulicornis* has a distinct juxta-antennal orbital white mark, the apex and not base of its second abdominal segment is red, the flagellum is equally black, and the spiracular area equally strongly carinate internally in both species; and the four front, not hind, femora of *F. annulicornis* are testaceous.

roughly alutaceous and dull, with a subhamate flavous mark on either side before the short but deeply impressed notauli; metathorax shagreened and more nitidulous, but slightly convex; petiolar area strongly carinate throughout and entire; areola ill-defined, subpyriform, longer than broad and confluent with the triangular basal area; lateral carinæ somewhat strong, both above and below the semicircular spiracles. *Scutellum* alutaceously punctate and dull, not distinctly convex; frenum strigose. *Abdomen* obsoletely punctate, shining, with short piceous hairs and broadest behind the centre; black, with the third and fourth segments, the apex of the second broadly, and of the first very narrowly, red; basal segment nearly thrice as long as apically broad, with the petiole parallel-sided, the spiracles distinct and subcentral, and the postpetiole gradually dilated; hypopygium covering the base of the shortly exserted terebra. *Legs* elongate; anterior pairs testaceous, with the coxæ and trochanters, except their flavescent apices, black; hind legs black, with the basal two-thirds of the externally spinulose tibiæ, and basal half of first tarsal joint, ferruginous; hind tarsi with joints two to four stramineous. *Wings* ample and hyaline; radix and tegulæ stramineous, the narrow stigma black and the nervures piceous; areolet not small, irregularly oblique, subpetiolate and well-defined; nervellus subopposite and intercepted slightly below its centre.

Fig. 88.
Euryproctus annulicornis, Cam.

Length 10 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species very closely resembles *E. albipes*, Holmg., of which Thomson considers the same author's *E. tuberculatus* to be the ♀, but his description differs from that of Holmgren, who terms the stigma of *E. albipes* infuscate and of *E. tuberculatus* stramineous, with the head of the latter more constricted posteriorly, while Thomson says the stigma and nervures are pale in both sexes. Unfortunately I have no personal acquaintance with these insects, which are mentioned by no other authors and have hitherto been met with only in Scandinavia, and our references are too scanty to allow me to synonymise them with any degree of certainty.

My description has been drawn from the type specimen.

230. **Euryproctus spinipes**, *Cam.*

Fovaya spinipes, Cameron,* Ann. Nat. Hist. xx, 1907, p. 21 (♀).

♀. A black species, with the abdomen centrally red, and the antennæ and hind tarsi pale-banded.

Length 10 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species so exactly resembles the last in every respect, except that of colour, that I am in great doubt as to its right to specific rank; especially is this the case since the structure in both is, in spite of their author's assertion to the contrary, entirely similar. *E. spinipes* is to be recognised solely by having the head black, with only a spot at the juxta-antennal orbits flavous and the labrum ferruginous; the thorax immaculate black; the abdomen black, with segments two to four entirely, but the first not at all, red; the anterior legs testaceous, with the coxæ and trochanters entirely, the front femora above towards the base and the intermediate (except at their extreme apices) black; the radix and tegulæ stramineous, with the latter basally blackish. Both species were founded on single specimens.

Genus **DYSPETES**, *Först.*

Dyspetes, Förster, Verh. pr. Rheinl. 1868, p. 201.

GENOTYPE, *Ichneumon prærogator*, L.

Body black and pubescent. Face subdeplanate, centrally and apically elevated; clypeus strongly discrete and apically very broadly rounded; mandibular teeth of equal length; eyes oblong and cheeks not short; vertex angularly excised centrally. Metathoracic areæ distinct, but not complete; the spiracles circular and not large. Abdomen with the carinæ of the hardly petiolate basal segment elongate but obsolete, and its subprominent spiracles slightly before the centre; second segment with broad and deeply impressed thyridii, third subimpressed basally on either side; hypopygium large and extending almost beyond the pygidium; terebra very slightly exserted. Tarsal claws stout and simple. Areolet entire and tetragonal, transverse, large and subsessile.

Range. Palæarctic Region.

Thomson first employed *Dyspetes* (as *Dyspetus*) in 1883 (Opusc. Ent. ix, pp. 895 et 899) for the reception of the present species, but he placed it in the TRYPHONINI, from the remainder of which he distinguished it by its complete areolet, stout and simple claws, and centrally angulated vertex. Ashmead is certainly in error in placing *Dyspetes*, as he does (Proc. U.S. Nat. Mus. 1900, p. 56), in the PIMPLINÆ and allying it with *Glypta* on account of the impressions of its second and third abdominal segments, which

represent little more than thyridii. With the exception of its Mesochoroid areolet, which is quite distinct in this subfamily, its whole facies is Tryphonid.

231. **Dyspetes prærogator**, *L.*

Ichneumon prærogator, Linnæus, Syst. Nat. 1758, p. 565; id., Faun. Suec. 1761, p. 405; Fabricius, Piez. 1804, p. 99; Jurine, Hym. 1807, p. 107; Gravenhorst, Nov. Ac. Acad. 1818, p. 285; Olivier, Encycl. Méth. viii, 1792, p. 191; Thunberg, Mém. Ac. Pétersb. 1824, p. 349.
yphon prærogator, Gravenhorst, Ichn. Eur. i, 1829, p. 687; ii, p. 127; Stephens, Illus. Mandib. vii, 1835, p. 232 (♂ ♀).
Mesolcius prærogator, Vollenhoven, Tijds. Ent. 1877, p. 64.
Dyspetus prærogator, Thomson, Opusc. Ent. ix, 1883, p. 899 (♂ ♀).

A black species, with white pubescence and the mouth and legs, except usually the hind ones, red. *Head* transverse, but not abruptly constricted posteriorly, occiput acutely emarginate centrally; frons and face distinctly punctate; clypeus subglabrous and, except basally, testaceous; mandibles and palpi concolorous. *Antennæ* as long as the body and filiform, black, becoming rufescent apically. *Thorax* black, dull and immaculate, with obsolete notauli; metathorax closely punctate, with the areola elongate, not discrete from the basal area and emitting no costulæ; lateral carinæ entire, and the small petiolar area discrete. *Scutellum* black and not margined. *Abdomen* shagreened and hardly shining, fusiform and apically obtuse; second and third segments subimpressed transversely before their apices, and obliquely in their basal angles; basal segment scabriculous and more than double the length of the stout terebra. *Legs* red, with the coxæ darker; hind legs usually entirely black. *Wings* hyaline or flavescent, with the stigma ferruginous; areolet transverse and large, hardly sessile; basal nervure continuous, and the nervellus intercepted slightly below its centre.

Fig. 89.
Dyspetes prærogator, L.

Length 7–11 millim.

Sikkim: Darjiling, 6000 ft., ix–x. (*E. Brunetti*—Ind. Mus.). Europe.

This is a very abundant autumn species in Europe, frequently found on umbelliferous flowers; it extends throughout nearly the whole continent, but nothing appears to be yet known respecting its economy.

Genus TRYPHON, *Fln.*

Tryphon, Fallén, Specim. Hym. 1813, p. 16; Holmgren, Sv Ak. Handl. 1855, p. 185.

Genotype, *T. signator*, Grav.

Head transverse, not or hardly dilated behind the eyes; frons sometimes centrally tuberculate; clypeus broadly rounded and not dentate at apex, very often transversely elevated beyond its centre; labrum hardly exserted; mandibular teeth of equal length. Antennæ filiform. Thorax stout, with the upper metanotal areæ often distinct. Abdomen subsessile; basal segment a little constricted basally throughout, generally with very distinct carinæ and a central longitudinal sulcus; its spiracles subcentral; second segment with distinct basal thyridii; terebra straight and short. Legs normal, with the femora somewhat short and stout; tarsal claws not pectinate; hind tibiæ bicalcarate. Areolet nearly always present, irregular and usually petiolate.

Range. Palæarctic and Nearctic Regions, Celebes.

Under this genus Gravenhorst placed an amazing medley of species in 1829; and only a part of them were elucidated by Holmgren in his restriction of it in 1855. It has consequently been impossible to tell how many of those still included under this head have a right to a position there, first because probably all the male Pimplinæ have not yet been relegated to their true position, and secondly because Förster, in 1868, split it up to a bewildering extent upon very trivial characters. Only one species, *Tryphon lutorius*, Smith (Proc. Linn. Soc. 1860, Suppl. p. 60), from Celebes, has hitherto been described from Asia. That herein placed by me appears to belong to the subgenus *Cœloconus*, Först. (Verh. pr. Rheinl. 1868, p. 203), since the interantennal tubercle is longitudinally sulcate above; but this should, I think, be treated as a *nomen nudum*: no generic type is indicated, and no species has hitherto been discovered which falls therein.

In Europe this genus is an extremely abundant one, its species being met with about midsummer upon every umbelliferous flower, but from India I have seen only a single specimen. It is said to prey parasitically upon Tenthredinidæ.

232. Tryphon antennatus, sp. n.

♂. A large, dull black species, with the tibiæ and centre of abdomen red. *Head* strongly transverse and narrow posteriorly; eyes prominent; vertex narrow and the frontal horn small, with its lateral carinæ extending to the apical ocellus; face and the continuous clypeus deeply and coarsely punctate, with sparse piceous pilosity; mandibles strong, dull red, with their base alone punctate and apex equally bidentate; palpi pale. *Antennæ* slightly longer than the body, not slender, filiform, with the

apices attenuate; black, with the flagellum basally rufescent, and scape flavous, beneath. *Thorax* with long pubescence; mesonotum finely and sparsely punctate, notauli inconspicuous; metathorax gradually declivous, finely punctate and discally nitidulous; lateral carinæ alone traceable; a strong carina on either side of the basally wanting petiolar area; basal area indicated and subcircular; spiracles elongate, vertical and not small. *Scutellum* subglabrous, immaculate and not convex. *Abdomen* elongate fusiform, broadest behind its centre and with long white hairs; first segment very gradually dilated throughout, its basal half with two parallel carinæ and discally sulcate to the central spiracles, thence pilose

Fig. 90.—*Tryphon antennatus*, Morl.

and obsoletely punctate; second segment slightly longer than apically broad, with its apex, whole of third segment, and basal angles of the fourth, dull red; ventral valvulæ exserted and not large. *Legs* black, with the femora subincrassate; anterior tibiæ, tarsi and inner side of front femora, testaceous; hind tibiæ, except at base and apex, testaceous; hind tarsi with the basal about as long as the apical joint, and double the length of the second. *Wings* ample and hyaline; tegulæ and stigma infuscate; areolet entirely wanting, with the radial nervure curved above it; nervellus postfurcal and intercepted at its centre.

Length 12 miliim.

United Provinces: Mussoori, 7000 ft., x.06 (*H. M. Lefroy*).

Type in the Pusa collection.

The very distinctly sinuate radial nervure is remarkable, and exactly resembles that of *Catoglyptus fortipes*, Grav., to which it is also allied in its unusually stout femora; but the equally bidentate mandibles, subsessile abdomen and the structure of the nervellus preclude its inclusion in that genus. It is also very distinct from most species of *Tryphon* in the complete absence of an areolet and metanotal areæ.

Described from a single male.

Genus **LABROSSYTA**, *Först.*

Labrossyta, Förster, Verh. pr. Rheinl. 1868, p. 202.
Labrossytus, Thomson, Opusc. Ent. xix, 1894, p. 2001.
Lapaphras, Cameron, Journ. Bombay Nat. Hist. Soc. 1902, p. 428.

GENOTYPE, *Ichneumon scotopterus*, Grav.

Head with the eyes not internally emarginate; clypeus apically rounded and strongly punctate; mandibles not stout, with the lower tooth hardly the longer. Thorax with no notauli, epomiæ or areæ, and the epicnemia abbreviated above; metapleural carinæ distinct. First abdominal segment short and not dilated basally, with the spiracles before centre, somewhat prominent and emitting no carinæ to apex of segment; postpetiole with no lateral margin; second segment with no basal lateral carinæ or thyridii. Legs not slender, with tibial calcaria short; tarsal claws very small, simple and hardly curved. Areolet distinct, irregularly oblique, petiolate, neither large nor rhomboidal; nervellus of hind wings intercepted below its centre.

Range. United States, North-West Europe, Himalayas.

This genus differs from *Syndipnus*, of which it was considered to form a section by Thomson (*loc. cit.*), in the possession of a distinct areolet, etc. So little has been known of the single Palæarctic representative of this genus, *Ichneumon scotopterus*, Grav. (Mem. Ac. Sc. Torino, 1820, p. 377), that Marshall left it in 1872, as placed by Stephens in 1835, in the genus *Tryphon*, and in 1880 Bridgman redescribed it (Entom. xiii, p. 54) under the name *Perilissus fumatus*. Two American species are also known. The testaceous body and dark wings of the Oriental species render it a very conspicuous insect.

233. **Labrossyta nigriceps**, *Cam.*

Lapaphras nigriceps, Cameron,* Journ. Bombay Nat. Hist. Soc. 1902, p. 428 (♀).

♀. A testaceous species, with the head and apices of legs black and the wings distinctly infumate. *Head* transverse, with the temples subbuccate behind the prominent eyes; face nitidulous, deplanate and longitudinally impressed on either side, distinctly discrete from the apically strongly punctate and prominent clypeus; mandibles weak, with the apical teeth subequal; palpi infuscate; labrum exserted and ferruginous; vertex narrow. *Antennæ* a little shorter than the body, black and filiform throughout. *Thorax* immaculate testaceous, with the notauli wanting; metathorax shining, convex, pilose and punctate, longitudinally unicarinate, with the petiolar area distinctly carinate, lateral carinæ curved and not weak, spiracles minute and circular. *Scutellum* testaceous, convex, pilose and obsoletely punctate.

Abdomen testaceous, subfusiform and a little longer than the head and thorax, pilose and nitidulous; basal segment slightly darker discally, bicarinate and subconstricted basally; terebra not exserted, basally concealed by the hypopygium. *Legs* not elongate or incrassate, testaceous, with the claws and the apices of all the posterior tibiæ and tarsal joints black; hind tibiæ subsinuate, with their calcaria pale. *Wings* ample and somewhat infumate throughout; radix and tegulæ testaceous, preceded by a black dot; costa, stigma and costal base of hind wings blackish; basal nervure curved above and continuous through the median; nervelet wanting; areolet distinct and irregularly oblique, petiolate and emitting the broadly fenestrate second recurrent almost from its apex; nervellus of hind wings intercepted almost at its lower angle.

Fig. 91.
Labrossyta nigriceps, Cam.

Length 7 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

Described from the type specimen.

Genus MESOLEIUS, *Holmg.*

Mesoleius, Holmgren, Sv. Ak. Handl. 1854, p. 62, et *op. cit.* 1855, p. 130.

GENOTYPE, *Tryphon aulicus*, Grav.

Head transverse and not buccate, nor posteriorly dilated, with the vertex emarginate; clypeus not elevated, usually distinctly discrete, apically truncate or emarginate, rarely rounded; mandibles with two subequal apical teeth; labrum hardly exserted. Antennæ setaceous and often longer than the body, with the scape ovate; basal flagellar joint usually half as long again as the second. Thorax with the notauli usually very distinct; metanotal areola sometimes obsolete or wanting, though generally entire; petiolar area nearly always distinct and entire. Scutellum subconvex. Abdomen sessile or subsessile, oblong ovate or elongate fusiform, and in ♀ often apically subcompressed; first segment gradually constricted basally, with discal sulcus not very distinct, and but shortly bicarinate a little beyond the antecentral spiracles; terebra straight. Legs slender, with the hind femora elongate and the tarsal claws not pectinate. Wings subample, with the areolet, in the restricted genus, entirely wanting.

Range. Palæarctic and Nearctic Regions.

This genus contains a very great number of species, as brought together by Holmgren in 1855 and 1876; but Förster has subdivided it into a great many subgenera, at least some of which are of none too stable formation. Excluding all the species placed apart in these latter divisions, we still know some 225 species of *Mesoleius*, which is exclusively parasitic upon the larvæ of TENTHREDINIDÆ; and this circumstance accounts for the paucity of representatives of the genus in India, though doubtless at least a few more will occur when the hill-stations are more fully worked.

234. **Mesoleius wahlbergi**, *Holmg.*

Mesoleius wahlbergii, Holmgren, Sv. Ak. Handl. 1876, p. 13 (♂).

♂. A black species, with the head and hind tibiæ partly stramineous and most of the legs red. *Head* not narrowed behind the eyes; vertex deeply emarginate; mouth, clypeus, the subbuccate cheeks and the broad face, flavidous. *Antennæ* ferruginous red beneath. *Thorax* stout, anteriorly subelevated; mesonotum shining, with the deeply impressed notauli extending to its disc and a flavidous callosity before the radices; mesopleuræ closely punctate below, strongly nitidulous and sparsely punctate above; metathorax short, finely alutaceo-rugose and not very shining, with the apically dilated areola and the semicircular petiolar area strongly circumcarinate. *Scutellum* black. *Abdomen* entirely black, with the basal segment a little longer than the hind coxæ, gradually dilated apically, laterally acutely margined throughout, with the discal sulcus and carinæ weak; second segment subcoriaceous; venter black. *Legs* red, with the anterior coxæ and trochanters flavous; hind ones stout and not short, with the coxæ and the stout tarsi black, their trochanters flavescent and tibiæ blackish, basally pale. *Wings* hyaline, with the stigma infuscate testaceous, radix and tegulæ pale stramineous; areolet wanting; nervellus subopposite and intercepted nearly in its centre.

Fig. 92.
Mesoleius wahlbergi, Holmg.

Length 7 millim.

KASHMIR, 6000 ft., v. 01 (*Col. Nurse*). LAPLAND.

Type in the Stockholm Museum.

This species does not appear to have been referred to since originally recorded as rare in central Lapland, where it was discovered by Prof. P. F. Wahlberg. I think that no doubt can remain that the Kashmir specimen, captured by Col. Nurse, is conspecific. The sole differences are that the antennæ, which are

filiform and somewhat stout, extending to the anus, are entirely black with only the apex of the scape pale testaceous beneath; the second segment is, like the remainder of the finely pubescent abdomen, finely and closely punctate; and the apices only of the hind trochanters, the basal two-thirds of their tibiæ, with the extreme base of the metatarsi, are stramineous.

Genus EXACRODUS, *Först.*

Exacrodus, Förster, Verh. pr. Rheinl. 1868, p. 210.

Genotype, not indicated.

Head transverse, subbuccate and posteriorly not broader than the internally entire eyes; labrum hardly exserted; upper mandibular tooth entire and shorter than the lower; clypeus neither discrete nor elevated, its apex simple; face deplanate. Metanotal areæ complete and strong; notauli wanting. Scutellum apically simple. Abdomen subpetiolate and not compressed; spiracles very slightly before centre of the basally narrowed and normal first segment. Legs slender, hind femora not elongate nor the intermediate dentate; tarsal claws not pectinate; hind tibiæ bicalcarate. Areolet wanting, stigma of normal size.

The following species agrees very well with Förster's description of this genus, and, though no species have hitherto been assigned to it, it is better, I think, to adopt a known name than to erect a new genus.

235. Exacrodus populans, sp. n.

♂. A black and somewhat slender species, with white pilosity. *Head* posteriorly subbuccate, but slightly narrower than the prominent eyes; frons and vertex convex and closely punctate; occiput bordered and centrally subemarginate; face subdeplanate and closely punctate, with a small central tubercle below the antennæ; clypeus not at all discrete or reflexed, deplanate, with its apex smoother and broadly rounded; mandibles entirely red, with the base as broad as the cheeks. *Antennæ* multi-articulate and as long as the body, black, with the pedicellus entirely and the scape beneath dull ferruginous. *Thorax* immaculate and somewhat short; mesonotum subnitidulous and closely punctate; metanotum shining and more finely punctate, with strong areæ; basal area small and transverse; areola a little longer than broad, parallel-sided, basally rounded and apically truncate, emitting strong costulæ from its basal third; petiolar area short and entire, subrectangular and a little broader than long; spiracles minute. *Scutellum* black, subconvex, not bordered, but broadly excavate basally. *Abdomen* shining and pilose, subfusiform, broader beyond centre, dull ferruginous, with the two basal segments, and anus

indeterminately, black; basal segment fully thrice as long as apically broad, subpetiolate and laterally strongly margined beyond its subcentral spiracles; remaining segments subquadrate; valvulæ exserted and not large. *Legs* entirely fulvous, with the hind ones rufescent and their tibiæ and tarsi infuscate. *Wings* not narrow, radix and tegulæ pale testaceous, stigma ferruginous, areolet wanting, though with a suggestion of a nervure at the

Fig. 93.—*Exacrodus populans*, Morl.

external half of its submarginal nervure, which is short; basal nervure continuous; nervellus antefurcal and strongly intercepted at its lower third.

Length 6 millim.

BENGAL: Pusa, xi. 06.

Type in the Pusa collection.

I have seen only the type of this species, which was bred from the Selandriid Sawfly, *Athalia proxima*, Klug.

Genus **MONOBLASTUS**, *Htg.*

Monoblastus, Hartig, Wiegm. Archiv. 1837, p. 155.
Cyphanza, Cameron, Journ. Bombay Nat. Hist. Soc. 1909, p. 723.

GENOTYPE, *Ichneumon neustriæ*, Schr.

Head transverse and generally tumidulous, with the face hardly prominent; clypeus not discrete, its lateral foveæ distinct, with no tufts of pilosity; mandibles with two subequal apical teeth. Antennæ filiform, about the length of the body and not centrally dilated; basal flagellar joint longer than the second. Thorax stout; metathorax short, with the upper areæ distinct. Abdomen subsessile, oblong-subfusiform; first segment bicarinate and gradually a little constricted basally; ovipositor not entirely concealed, though short and hardly exserted. Legs of normal length; hind tibiæ bicalcarate; tarsi not incrassate, with the

claws distinctly pectinate basally. Wings with the areolet present.

Range. Palæarctic and Nearctic Regions.

The genus under this name, doubtfully synonymised by him with that previously erected by Hartig, was brought forward by Holmgren (Sv. Ak. Handl. 1855, p. 385) as comprising that section of *Polyblastus*, Htg., having the clypeus continuous with the face and not divided from it by a transverse sulcus, which feature, he tells us, will distinguish its species from the remainder of their subfamily. He is, however, in error in supposing the hosts to be Lepidopterous, since in every case they have hitherto proved to be the Tenthredinid genera *Nematus* and *Dineura*.

A dozen European species, and three or four American, have been relegated to this genus; but only two Indian forms are at present recognised.

The genus *Cyphanza* is placed among the Tryphonini by its author, who entirely failed to note the pectination of the tarsal claws in his elaborate diagnosis (*loc. cit.*), where he considers it allied, in Ashmead's tables of 1900, to *Gensia*, Först., a quite untenable position. I have examined the type and am satisfied of its synonymy with Hartig's genus.

Table of Species.

1 (2) Abdomen, except basally, clear red; ♀ ...... *orientalis*, Cam.
2 (1) Abdomen discally black throughout; ♂ .... *niger*, Cam.

236. **Monoblastus orientalis**, *Cam.*

Monoblastus orientalis, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 727 (♀).

♀. A black species, the face with pale markings and the abdomen apically red. *Head* transverse, as broad as thorax and not narrowed behind the very slightly emarginate eyes; frons and vertex finely punctate and somewhat shining, the former longitudinally impressed and subglabrous centrally; face evenly and somewhat coarsely punctate, and with long white hairs, black, with a conspicuous circular flavous mark beneath each scrobe: clypeus convex and apically broadly rounded; mandibles stout. *Antennæ* filiform and as long as the body, black, with the flagellar joints becoming ferruginous beneath towards the apex. *Thorax* stout, pilose and immaculate black; mesonotum shining and finely punctate, apically subvertical, with no notauli; metanotum evenly and more closely punctate, with the areola laterally

Fig. 94.
Monoblastus orientalis, Cam.

strong and parallel-sided, its costulæ and apical carina subobsolete; lateral carinæ distinct, spiracles elongate and not small. *Scutellum* black, punctate and hardly convex. *Abdomen* clear red, finely punctate and pilose, with the two basal segments (except at their apices) black, and the spiracles of the laterally strongly margined first segment a little before its centre; terebra very short, reflexed, with the valvulæ red. *Legs* black and with distinct white hairs, the anterior tibiæ and tarsi dull testaceous. *Wings* broad and ample; tegulæ and stigma piceous, radix testaceous; areolet irregular, transversely triangular and elongately petiolate, with its outer nervure, like the recurrent, broadly fenestrate; radial cell short and subtriangular; lower wings with the nervellus subcontinuous and distinctly antefurcal, intercepted far below its centre.

Length 7 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

My description is drawn from the type of the species, which is the only example I have seen.

237. **Monoblastus niger**, *Cam.*

Cyphanza nigra, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 723.

♂. A black species, with only the anterior tibiæ and tarsi testaceous, and the face white above.

Length 7 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

The elaborate characters upon which Cameron erected a new genus for this species certainly correspond exactly with all those of *Monoblastus*, though he quite failed to mention the distinct pectination of the claws. In fact so closely is this insect related to *M. orientalis* that I should be induced to regard it as the male of that species, if a distinct name had not already been proposed for it. The type has the head badly crushed and the facial shield dislocated, but the sculpture is identical with that of *M. orientalis*, though the pale spots are larger and subconfluent, the flagellum is a trifle thicker and the disc of the abdomen black throughout; in all other respects the two agree entirely.

Genus **ICYONA**, *Cam.*

Icyona, Cameron, Zeits. Hym.-Dip. 1903, p. 340.

GENOTYPE, *I. rufipes*, Cam.

Head obliquely constricted behind the large and internally parallel eyes; occiput margined and broadly incised; face elongate and circularly prominent in the centre; cheeks as long as the

scape; clypeus not discrete, apically rounded and deeply foveate at the base on either side; mandibles largely bidentate, with the upper tooth longer and more acuminate than the lower. Metathorax elongate, with no carinæ and its spiracles elongate. Scutellum roundly convex. Abdomen with the four basal segments distinctly longer than broad; the basal elongate and not much widened apically, with almost central spiracles; terebral valvulæ strongly projecting, stout and straight. Legs elongate, with apices of hind femora nearly extending to anus, their coxæ elongate and fully four times as long as broad; posterior tibiæ bicalcarate; tarsi spinose, with their claws closely and distinctly pectinate. Wings with the areolet quadrate and somewhat large, laterally coalescent above, and emitting the straight and broadly fenestrate second recurrent nervure from its centre; radial cell narrow and elongate, nervelet distinct; hind wing with nervures extending to the apex, the lower longitudinal one originating near the top.

Range. Simla.

Its author says this genus, the type of which is not in Col. Nurse's collection, "belongs to the CTENOPELMINI and comes near to *Ctenopelma*."

238. **Icyona rufipes**, *Cam.*

Icyona rufipes, Cameron, Zeits. Hym.-Dip. 1903, p. 340 (♂ ♀).

♂ ♀. *Head* black, with the lower half of the inner orbits broadly, the lower two-thirds of the sparsely punctate clypeus, and the cheeks (in ♂), flavous; face apically rufescent; frons and vertex closely punctate; palpi testaceous and mandibles tricoloured. *Antennæ* black; of ♂ with the scape flavescent, and flagellum piceous, beneath. Pro- and mesothorax closely and uniformly punctate; metathorax much more strongly and rugosely punctate, with dense short white pubescence. *Scutellum* closely and uniformly punctate, with its apex glabrous, nitidulous and testaceous. *Abdomen* shining and red, with the basal half of first segment subflavescent. *Legs* red, with the coxæ, base of trochanters above, and a basal line on the anterior femora, black; four apical joints of hind tarsi flavous. *Wings* hyaline and iridescent, with the stigma testaceous and the nervures blackish.

Length 14 millim.

PUNJAB: Simla (*Col. Nurse*).

Type. Location unknown.

I have not seen this species.

Genus **CTENACME**, *Först.*

Ctenacme, Förster, Verh. pr. Rheinl. 1868, p. 196.
Ctenacmus, Thomson, Opusc. Ent. ix, 1883, p. 901.
Pauroctenus, Cameron, Journ. Bombay Nat. Hist. Soc. 1909, p. 726.

GENOTYPE, *Polyblastus scutellatus*, Thoms.

Head with the clypeus distinctly discrete from the face, with its lateral foveæ not scopulate; mandibles glabrous, convex discally at the base and narrowed towards the apex. Antennæ not centrally incrassate. Epicnemia interrupted above. Abdomen sessile, with the central segments not red; first segment somewhat short, basally subauriculate and often transversely impressed before its apex; terebra not entirely concealed; hypopygium large, vomeriform, not retracted but broadly covering the base of the terebra. Legs with the tarsi not incrassate, nor calcaria elongate; claws stout, closely and elongately pectinate. Areolet sometimes wanting; basal nervure vertically curved and divergent.

Range. North-West Europe, Himalayas.

An examination of the type of Cameron's genus convinces me that this differs in no material degree from Förster's as enunciated by Thomson, though belonging to none of the three Swedish species described by the latter, which are the only ones at present brought forward. Cameron tells us, "the affinities of this genus [*Pauroctenus*] may be left over until the ♀ is known. It comes near *Polyblastus* in the tables given by authors." Unfortunately, he mistook the sex of the type.

239. **Ctenacme pallidipes**, *Cam.* (emend.).

Pauroctenus pallipes, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 727 (♀, as ♂).

♀. A black species, with the legs, venter and mouth flavescent. *Head* as broad as the thorax and gradually rounded behind the internally parallel eyes; vertex not broad, somewhat convex and, like the deplanate frons, very finely punctate; face more distinctly punctate, black, shining and centrally prominent, with distinct juxta-antennal foveæ; clypeus triangular, subglabrous and stramineous, with a conspicuous black basal tubercle, its apex rounded and narrowly reflexed; mandibles stout and stramineous, with their bifid apices rufescent; ligula and palpi stramineous. *Antennæ* filiform, not stout, black, with their apices ferruginous beneath, and the flagellar joints slightly compressed beyond the centre. *Thorax* immaculate black; mesonotum shining and obsoletely punctate, with obsolete notauli; metathorax short and somewhat small; areola complete, parallel-sided and apically subtruncate, with the lateral areæ trans-aciculate, costulæ wanting and petiolar area discrete; apophyses small and obtuse, spiracles circular and not large. *Scutellum* normal and black. *Abdomen*

black, with the extreme apices of the segments obsoletely white; basal segment not convex, scabriculous and discally bicarinate to the shallow subapical transverse impression, with the spiracles before its centre; remaining segments transverse, shining and

Fig. 95.—*Ctenacme pallidipes*, Cam.

obsoletely punctate; venter pale; spicula slightly exserted beyond the stout and grey-pilose valvulæ, the bases of which are covered by the stout and pale hypopygium. *Legs* of normal length and entirely stramineous, with only the apices of the hind tibiæ and of their tarsal joints blackish. *Wings* ample and hyaline; radix and tegulæ stramineous, stigma testaceous; areolet sessile and triangular; nervellus subopposite and intercepted below its centre.

Length 5 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

I have drawn the above description from the type specimen, which is the only example I have seen. It would appear to differ from all others of its genus in the basally tuberculate clypeus and peculiar facial foveæ; the very slightly compressed antennæ are also remarkable. Cameron, however, appears to have examined more than the type, since he gives the length as 6–7 millim.

Genus **RHORUS**, *Först.*

Rhorus, Förster, Verh. pr. Rheinl. 1868, p. 195.

GENOTYPE, *Tryphon mesoxanthus*, Grav.

Head transverse and hardly buccate, vertex emarginate; clypeus transverse and convex, with its apical margin depressed, truncate or rounded; mandibular teeth stout and subequal in length; eyes entire and oblong-oval. Antennæ filiform, distinctly stout and as

long as the body. Thorax stout, often with apical notauli; metathorax semiglobose, with circular spiracles; areola and petiolar area often confluent. Scutellum a little elevated and often pale. Abdomen elongate-subfusiform, shortly pilose and distinctly petiolate; basal segment straight, convex, constricted before the almost antemedial spiracles, with the postpetiole gradually a little dilated to apex, and the discal sulcus usually distinct; second and third segments subequal in length; terebra stout and not concealed. Legs normal, with the hind femora subincrassate; tarsal claws very distinctly, usually elongately and coarsely pectinate. Areolet usually entire, radial cell lanceolate, nervellus intercepted above, in or below its centre.

Range. United States, North-West Europe, Ceylon.

This genus is so closely allied to *Ctenopelma* that it is doubtful if it has a right to any separate existence, since the impressed clypeus appears but a poor distinction. However, it is now generally recognised on the Continent and consequently is adopted here, though some doubt must be entertained respecting the propriety of including in it Cameron's species, since it has the terebra nearly one-fourth the length of the whole body (which feature appears to ally it more closely with the OPHIONINÆ) and he himself says that it "is probably not a typical *Rhorus*, but there is no other genus into which I can make it enter." Unfortunately, I can throw no light upon its position, as I have seen no Oriental species of the genus, which is characterised by having the clypeus neither distinctly discrete nor apically impressed, the tarsal claws closely and elongately pectinate, and the abdomen distinctly petiolate.

240. Rhorus spinipes, *Cam.*

Rhorus spinipes, Cameron, Spolia Zeylanica, 1905, p. 132 (♀).

♀. A smooth and shining black species, with profuse flavescent markings. *Head* with face, cheeks, mandibles, internal orbits, and apex of clypeus, flavous. *Antennæ* longer than the body, with the flagellum piceous, and scape with a flavous marking, beneath. *Thorax* black, with a mark (triangularly dilated apically) on either side of the mesonotum, another subcircular one at base of mesopleuræ, a larger triangular one at their apex, callosities beneath the hind wings, apices of the obscurely and transversely striate metanotum, flavous; metanotum longitudinally sulcate throughout the basal half of its disc. *Scutellum* flavous. *Abdomen* smooth and nitidulous, shortly and densely pilose, with the apices of all its segments flavous. *Legs* flavescent; hind legs with the trochanters mainly, their coxæ beneath, and the tarsi, black; the femora rufescent, and the tibiæ ferruginous, becoming apically blackish; posterior tibiæ and tarsi densely spinose. *Wings* hyaline, with the stigma infuscate; areolet obliquely triangular and shortly

petiolate; basal nervure continuous through the median, second recurrent continuous with the external nervure of the areolet; nervellus intercepted distinctly below its centre.

Length 7 millim.; terebra 2 millim.

CEYLON: Kandy (*E. E. Green*).

Genus SCOLOBATES, *Grav.*

Scolobates, Gravenhorst, Ichn. Eur. ii, 1829, p. 357.

GENOTYPE, *Ichneumon auriculatus*, F.

Head very smooth, buccate posteriorly, with the vertex deeply emarginate and the cheeks large; clypeus hardly discrete basally, its apex dentiformly produced centrally; mandibles stout and bidentate, with the teeth of equal length; eyes entire and not small. Antennæ filiform and fully as long as the body, with their apices subattenuate; scape obliquely truncate apically. Metanotal areæ wanting; spiracles oval. Abdomen petiolate, more or less compressed laterally; basal segment deplanate and straight, parallel-sided, with the spiracles before its centre; terebra short and not extending beyond the anus. Hind legs longer and stouter than the front ones, with bicalcarate tibiæ, more or less incrassate tarsi and closely pectinate claws. Areolet wanting.

Range. North and Central America, Europe, Himalayas. Erroneously recorded from New Zealand.

This species is, I think, best recognised by the peculiarly large and shining head, its centrally produced clypeus and distinctly compressed abdomen. Originally its main feature was the incrassate hind tarsi, and this is very conspicuous in certain species, though but feebly developed in the Indian ones; on account of it and the compressed body this genus was thought at first to be allied to *Anomalon* and it was even retained in the OPHIONINÆ by Holmgren in 1858, though in the aberrant group of the BANCHIDES, with which it obviously has nothing in common. It certainly belongs to the Ctenopelmid group of the TRYPHONINÆ and is somewhat closely allied to *Euceros*, Grav., the species of which have, like it, been bred from Lepidopterous hosts. *Scolobates* is also said to prey upon Syrphid flies and TENTHREDINIDÆ; but *cf. Bassus lætatorius* (p. 278).

Table of Species.

1 (2) Testaceous, with black markings; nervellus geniculate below centre .... *testaceus*, sp. n.
2 (1) Black, with red markings; nervellus geniculate at its centre .... *auriculatus*, F.

241. **Scolobates testaceus**, sp. n.

♀. A handsome, shining testaceous species, with somewhat indefinite black markings. *Head* but slightly narrowed behind the prominent eyes; occiput, ocellar region externally, a mark between the scrobes extending to the face, and the apices of the mandibles, black; cheeks flavescent. *Antennæ* stout and infuscate-ferruginous, with all the joints short and the basal becoming rufescent beneath. *Thorax* not long, strongly nitidulous throughout, testaceous, with marks on mesopleuræ, mesonotum centrally and above the radices, above hind frenum and in centre of metanotum, black; mesosternum flavescent; notauli obsolete; metanotum longitudinally convex on either side at base. *Scutellum* convex, rufo-flavescent. *Abdomen* strongly compressed from the second segment, pilose and testaceous, with basal black marks on all the segments, becoming larger on the basal ones; first segment strongly elongate and indefinitely bicarinate at base; spicula emarginate beneath the acuminate apex. *Legs* testaceous, with only the small pulvilli and claws, and basal half of hind coxæ, black; hind legs elongate, but not conspicuously incrassate. *Wings* somewhat strongly and evenly infumate; radix, tegulæ and stigma ferruginous; nervellus intercepted below its centre.

Length 8 millim.

United Provinces: Mussoori, 7000 ft., x.06 (*H. M. Lefroy*).

Type in the Pusa collection.

242. **Scolobates auriculatus**, *F.*

Ichneumon auriculatus, Fabricius, Piez. 1804, p. 69.
Scolobates crassitarsus, Gravenhorst, Ichn. Eur. ii, 1829, p. 360; Stephens, Illus. Mandib. vii, 1835, p. 269; Fonscolombe, Ann. Soc. Ent. France, 1849, p. 237; Kriechbaumer, Ent. Nachr. 1877, p. 134; v. Stein, Ent. Nachr. 1880, p. 103 (♂ ♀); Davis, Trans. Amer. Ent. Soc. 1897, p. 264 (♀).
Scolobates auriculatus, Ratzeburg, Ichn. d. Forst. ii, 1840, p. 77; Holmgren, Öfv. Sv. Ak. Förh. 1858, p. 330; id. Sv. Ak. Handl. 1858, p. 154; Taschenberg, Hym. Deuts. 1866, p. 74 (♂ ♀).
Prionopoda canadensis, Harrington, Canad. Entom. 1892, p. 98 (♀).

A smooth and strongly nitidulous species, black, with the head mainly and the abdomen centrally red. *Head* buccate, tumidous and very smooth, parallel-sided behind the eyes; mouth, frontal orbits, cheeks very broadly and the sparsely punctate face, fulvescent. *Antennæ* somewhat longer than the body, stout, filiform and apically subattenuate, red or ferruginous beneath; scape obliquely truncate apically, and the first longer than second flagellar joint. *Thorax* gibbulous, very smooth, a little longer than high, black; sternum punctate; metanotum glabrous, with no areæ, though impressed on either side at both base and apex. *Scutellum* black. *Abdomen* centrally red, about as long as head and thorax, deplanate or (in ♀) apically subcompressed; basal

segment straight, hardly extending to apex of hind trochanters, deplanate and apically strongly widened, with the spiracles prominent and subcentral; second segment subquadrate and the following transverse; terebra straight and not extending beyond the anus. *Legs*: anterior pairs somewhat slender and red, basally black; hind ones stout and longer, black, with whole of femora

Fig. 96.—*Scolobates auriculatus*, F.

and extreme base of tibiæ red; hind tarsi broad, with their claws distinctly pectinate. *Wings* very slightly infumate with the stigma infuscate piceous, radix testaceous and tegulæ blackish; radial nervure curved; nervellus strongly intercepted nearly in its centre.

Length 5–9 millim.

KASHMIR, 5000–6000 ft., v. 01 (*Col. Nurse*). EUROPE. NORTH AMERICA.

This is a very variable species in size, but its colour, the incrassate hind tarsi and peculiarly broad head, render it unmistakable.

It is nowhere common, though occurring throughout nearly the whole of Europe and Northern America from Ottawa to Texas. The older authors thought it parasitic on Lepidoptera (*Smerinthus ocellatus*, Ratz. *l. c.*), but it attacks TENTHREDINIDÆ (*Hylotoma pagana*, Bché, and *H. rosæ*, Giraud (Ann. Soc. Ent. France, 1877, p. 407); the observations of Hudson (Ent. 1884, p. 171) and W. W. Smith (E. M. M. 1900, p. 160) refer to *Bassus lætatorius*, F. (*v.* p. 278). The only Indian example I have seen is a somewhat small but very typical female.

Genus MEGASTYLUS, *Schiöd.*

Megastylus, Schiödte, Guér. Mag. Zool. 1839, Ins. pl. vi.
Helictes, Haliday, Ann. Nat. Hist. ii, 1839, p. 115.
Letosha, Cameron, Journ. Bombay Nat. Hist. Soc. 1909, p. 725.

GENOTYPE, *M. cruentata*, Schiöd.

Head subtransverse, constricted towards the mouth; face slightly, and eyes very distinctly, prominent; the subcircular vertex strongly discrete from the occiput; clypeus arched; mandibular teeth slightly unequal; labrum not exserted. Antennæ elongate, setaceous, at least 30-jointed; scape subglobose; no flagellar joints emarginate, nor the first shorter than second. Mesothorax elevated, with the notauli weakly impressed; metathorax usually rectangular, and not perpendicularly truncate at apex; metanotum not basally areated, nor transversely carinate in the centre. Scutellum convex. Abdomen deplanate and spatulate, not laterally compressed; basal segment narrow, elongate, with the spiracles slightly before its centre; terebra very shortly or hardly exserted, straight. Wings distinctly narrow; areolet entirely wanting; stigma not abnormally narrow; nervellus subopposite and obsoletely intercepted a little below its centre.

Range. Palæarctic and Nearctic Regions.

This is a widely distributed genus, somewhat rich in species in both hemispheres. For a long period it was regarded as pertaining to the TRYPHONINÆ; but modern authors seem fairly unanimous in placing it in the PLECTISCINI group of the OPHIONINÆ, which I consider erroneous, since the strongly deplanate abdomen and concealed terebra point to affinity with the former subfamily. But, as remarked by Ashmead (Proc. U.S. Nat. Mus. 1900, p. 101), the PLECTISCINI, as at present constituted, are scarcely a natural group; and this is one of its most abnormal genera. The single Indian species at present known was erroneously placed in a new genus by Cameron and appears to bear considerable resemblance to *Mesoleptus albocollaris*, Cresson (Trans. Amer. Ent. Soc. 1868, p. 100; *cf.* Davis, *op. cit.* 1897, p. 246); the former says respecting it, "the precise affinities of this genus may be left over until its ♀ is known. From the position of the abdominal spiracles I refer it, for the present, to the TRYPHONIDÆ, tribe MESOLEPTINI," where he had previously relegated true *Lissonotæ*.

243. Megastylus longicoxis, *Cam.*

Letosha longicoxis, Cameron,* Journ. Bombay Nat. Hist. Soc. 1909, p. 725 (♀, as ♂).

♀. A somewhat small and very slender species. *Head* small and subquadrate, nearly parallel behind the mutilated eyes; occipital carina very strong; vertex broad, sparsely punctate, with a few long griseous hairs and a distinct longitudinal sulcus; frons deplanate and nitidulous; face glabrous and strongly nitidulous,

subimpressed on either side, with the epistoma a little protuberant and a deep sulcus between the antennæ, entirely stramineous, with the colour rising triangularly a little above the scrobes; clypeus very prominent, tuberculiform, subcircular, stramineous, basally strongly discrete and apically black; mandibles weak, narrow and apically acuminate, stramineous, with the apical teeth, of which the lower is much the longer, small and ferruginous. *Antennæ* much longer than the body, slender, setaceous and finely pilose, with the apical joints well discrete, piceous, with the basal three or four joints rufescent, at least beneath. *Thorax* slender and subcylindrical, black, with the prothorax basally

Fig. 97.—*Megastylus longicoxis*, Cam.

throughout, a mesopleural mark before the radices broadly, and its basal carina narrowly, stramineous; mesonotum glabrous and nitidulous, apically elongate and constricted at the obsolete notauli; metathorax irregularly shagreened, very small dorso-ventrally, though hardly narrower discally than the mesonotum; metanotum but slightly convex and not depressed apically, lateral carinæ distinct and connected by two transverse carinæ, across the disc and before the petiolar area; spiracles circular and not small. *Scutellum* glabrous, triangular, subconvex and laterally carinate to its apex, which is, like that of the postscutellum, ferruginous. *Abdomen* linear and subnitidulous, becoming duller, pilose and broader before its apex; black, with the base of the first two, apex of second, whole of third segments, and the anus, indeterminately rufescent; basal segment parallel-sided, about five times as long as broad, glabrous and laterally sparsely pilose, with the apex subnodulose and the spiracles distinctly before the centre;

second broader, though hardly shorter, and slightly widened apically; ventral fold strong on the three pale basal segments; spicula dark, valvulæ flavescent, slightly exserted from the hypopygium, which extends to the anus. *Legs* elongate and very slender, the anterior testaceous, with the coxæ and trochanters stramineous; hind legs red, with the large and strongly transstrigose coxæ black, trochanters pale and the hind tarsi white, except the basal and apical half of the last joint, which are, like the apices of their tibiæ, blackish. *Wings* narrow but not small; stigma, costa and nervures piceous; radix and tegulæ stramineous; basal nervure not quite continuous; second recurrent broadly bifenestrate.

Length $8\frac{1}{2}$ millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

The foregoing description is drawn from the type of the species.

Subfamily OPHIONINÆ.

The number of species of this subfamily that have been described or recorded from Asia, outside British India, is probably about equal to the forty-three kinds given by Dalla Torre as indigenous to this area in 1901. The principal authors of the former are Kokujew, who has erected several species of *Paniscus* from Russian Transcaucasia, Pamir, Siberia and Transcaspia (Horæ Soc. entom. Ross. 1899, p. 142, etc.); Brullé and Taschenberg (Zeits. Ges. Nat. 1875, p. 421), who have described a few large species from Halmaheira, Java, etc.; Van Vollenhoven also described some conspicuous insects from Batavia; Smith brought forward a few from Chinese Turkestan and others from Japan (Trans. Ent. Soc. Lond. 1874, and Second Yarkand Mission). And from the latter locality, Francis Walker described (Cistula Entom. 1874, p. 306, etc.) new kinds of *Sagaritis*, *Campoplex* and *Charops*; while an Anomalid is recorded by Kriechbaumer (Nat. Ges. Leipzig, 1894, p. 129). Smith has further informed us of others from Celebes, Borneo, Kaisaa, etc. (Proc. Linn. Soc. Lond, 1860, Suppl. p. 64); Holmgren found a new *Limnerium* from China (Eugenies Resa, Insect. 1868, p. 412), and Radoszkowsky an undescribed *Ophion* from Korea (Horae Soc. ent. Ross. 1887, p. 433). This, with the addition of a very few species brought forward by Olivier, Tschek and others from Asia Minor, represents practically the total of our knowledge up to the beginning of the present century.

To the above forty-three species Cameron has subsequently added some sixty kinds, in publishing the captures of Col. Nurse in North-West India and of Mr. Green in Ceylon. These were

brought forward in a very scattered form in various English, Dutch, German and Indian Magazines; while several of the types that I had the opportunity of examining, both in the British Museum and Col. Nurse's collections, bore MS. names in Cameron's hand. Many of these species proved upon examination to be conspecific with Palæarctic forms, but I consider rather more than seventy of them to represent good species, and these, with those I have been enabled to synonymise with previously described kinds and the fifty that do not appear to have been hitherto noticed, give us a present total of some 163 species distributed through 49 genera.

The Ophioninæ are at once known from all other Ichneumonidæ by their very distinctly compressed abdomen, and can only be confused with the Evaniidæ which emit the abdomen from the disc of the metanotum and not, as in the present case, from its apex. In this character, however, the Anomalides tend slightly from the normal by having the apex of the metathorax a little produced above the abdominal base, and they may further be known by their total lack of an areolet and spatulately dilated hind tarsi. The difficult tribe of Campoplegides also often lacks the areolet, which appears rather the rule than the exception, for the Ophionides go so far as to emit the second recurrent vein before and not beyond the submarginal nervure, which abnormal conformation is shared by the Nototrachides, which are distinguished by their calcaria. The Paniscides approach the Tryphoninæ in their peculiarly curved radial nervure, basally broad abdomen and pectinate tarsal claws; though that they are also related to the aberrant Mesochorides, which tribe has recently been raised by Szépligeti to the position of a subfamily, I am now able to prove by the discovery of an undoubted Paniscid with a pronounced Mesochorid facies. The tribes Cremastides and Pristomerides are hardly distinct and differ only in the possession by the latter of a more or less obvious tooth beneath the hind femora; they both have a large and conspicuous stigma, a feature shared by the Porizonides, though in this case the radial cell is very broad, with its central angle subacute and the submarginal nervure obsolete, whereas in the two former tribes the radial cell is sublanceolate and the submarginal elongate. Prof. Thomson was of opinion that the Plectiscides appertained to the Tryphoninæ rather than to the present subfamily, but, as Schmiedeknecht truly remarks, "as long as they are made to embrace an assemblage of strongly differing forms, there can be no object in arguing where they are best placed!" And, as regards India, we are spared the trouble, for I have seen no more than three specimens thence, which in the present inadequate state of our knowledge, it were useless to bring forward yet. The following tribes are fully as distinct *inter se* as are those of the Tryphoninæ, and specimens can be attributed to each at a glance, with a little experience:—

Table of Tribes.

1	(2)	External abscissa of radius basally continuous with first submarginal nervure	PANISCIDES, p. 345.
2	(1)	External abscissa of radius basally angled at its junction with first submarginal nervure.	
3	(6)	Second recurrent nervure emitted before submarginal.	
4	(5)	Intermediate tibiæ bicalcarate; antennæ elongate	OPHIONIDES, p. 362.
5	(4)	Intermediate tibiæ unicalcarate; antennæ short	NOTOTRACHIDES, p. 397.
6	(3)	Second recurrent nervure emitted beyond first submarginal.	
7	(8)	Hind tarsi spatuliform; metathorax apically produced	ANOMALIDES, p. 401.
8	(7)	Hind tarsi not spatuliform; metathorax not produced.	
9	(18)	Areolet not obliquely quadrate; abdomen strongly compressed.	
10	(11)	Stigma and radial cell narrow and elongate	CAMPOPLEGIDES, p. 433.
11	(10)	Stigma and radial cell broad, with the latter short.	
12	(17)	Submarginal nervure distinct; median of hind wing basally strong.	
13	(16)	Hind femora simple.	
14	(15)	Clypeus not convex or compressed; hind tibiæ normal	CREMASTIDES, p. 497.
15	(14)	Clypeus convex and compressed; hind tibiæ incrassate	PLECTISCIDES.*
16	(13)	Hind femora distinctly dentate beneath	PRISTOMERIDES, p. 507.
17	(12)	Submarginal nervure obsolete; median of hind wings basally pellucid	PORIZONIDES, p. 511.
18	(9)	Areolet obliquely quadrate; abdomen not compressed	MESOCHORIDES, p. 515.

Tribe *PANISCIDES*.

A tribe of yellowish or reddish insects, usually of somewhat large size. Thorax shining and never strongly sculptured; notauli distinct but rarely deeply impressed; metathorax subdeclivous throughout and not apically produced above the hind coxæ. Abdomen slender and not deplanate; basal segment elongate and subparallel-sided, rarely subpetiolate or subsessile, with the spiracles always before its centre; terebra exserted or subconcealed, ♂ valvulæ large and strongly exserted. Tarsal claws nearly always strongly pectinate; intermediate tibiæ distinctly bicalcarate. Wings very ample; areolet rarely wanting, usually

* No Indian species are described in this volume.

triangular or obliquely rhomboidal, with the nervures subentire (the external often fenestrate below) and always coalescent above, emitting the external abscissa of the radius in a strong curve, which basally forms an acute angle with the internal radial abscissa; stigma never broad or triangular, often pale; nervellus intercepted above, very rarely at or below, its centre.

The constant red-yellow colour of members of this tribe distinguish them at once from all other ICHNEUMONIDÆ, except the OPHIONIDES, with which tyros are apt to confuse them until they come to notice that they possess a very conspicuous deltoid alar areolet (or in *Parca*, which possesses no areolet, the second recurrent is not emitted before the submarginal nervure), whereas in OPHIONIDES the areolet is invariably wanting and the second recurrent emitted distinctly before the submarginal. The species are socially parasitic upon larvæ of Lepidoptera, constructing for themselves tough black or brown cocoons, and many or all of their larvæ are ectoparasites.

This group is very well represented in the Indian fauna, more especially in the hills of Ceylon, Assam, Baluchistan and Kashmir; but our knowledge is far too scanty at present to allow us to generalise respecting their distribution. I have experienced considerable difficulty in recognising in nature the various descriptions that have been published, on account both of their superficial character and the actual similarity of the species constituting this tribe. The latter cause has been a stumbling block to their elucidation throughout the world, and nowhere more so than in Europe, where they have received the most attention; but even here Thomson, I consider, to a great extent failed in their classification, quite possibly for lack of material. Very few of the two dozen Palæarctic kinds have yet been assigned definite characters; and there appears ground for believing that, when a general synonymy has been effected of this group, whose species are found throughout both hemispheres, their specific range will prove to be much more extensive than at present supposed.

Table of Genera.

1 (6) All the tarsi pectinate; areolet entire.	
2 (5) Spiracles of basal segment distinctly before centre; areolet triangular.	
3 (4) Lower much further from base than upper basal nervure	PANISCUS, Schr., p. 347.
4 (3) Basal nervure continuous through median nervure	PARABATUS, Thoms., p. 357.
5 (2) Spiracles of basal segment central; areolet quadrate	TETRAGONALYS, Morl., p. 359.
6 (1) Tarsi simple; areolet wanting; petiolar spiracles central	PARCA, Morl., p. 361.

Genus PANISCUS, *Schr.*

Paniscus, Schrank, Faun. Boica, ii, 1802, p. 311, *note*.
Paropheltes, Cameron, Journ. Bombay Nat. Hist. Soc. 1907, p. 111.—(Type *P. flavolineatus*, Cam.)

GENOTYPE, *P. testaceus*, Grav.

A genus of somewhat large, testaceous-red species, with a distinct areolet. Head transverse, short and sometimes subbuccate behind the internally distinctly emarginate eyes; clypeus discrete, subelevated, with its apex obtusely rounded and ciliate; mandibles narrow, with the teeth strongly unequal, the lower being much the shorter; palpi quadriarticulate, with the apical joint filiform; ocelli large and sometimes remote from the eyes; occipital carina distinct and continuous with the genal. Antennæ filiform and slender, with the scape subovate and deeply incised apically. Metathorax with oblong spiracles. Abdomen compressed or subcompressed and distinctly petiolate; basal segment straight, with the spiracles before its centre; terebra very distinctly exserted. Legs slender, with the tarsal claws strongly and elongately pectinate. Wings ample, with the areolet always entire; basal nervure by no means continuous through the median, but the lower basal very distinctly further from the base than the upper basal.

Range. Cosmopolitan.

This genus is very liable to be confused with *Ophion* or *Henicospilus*, since the coloration of all its species, and the large size of several, produces a superficially close resemblance to the OPHIONIDES. The distinct alar areolet and the position of the petiolar spiracles will instantly separate them, however; and, in spite of this resemblance, there appears to be little affinity in nature between the two groups. *Paniscus* has been somewhat recently divided by Thomson into several genera, of which only his *Parabatus* also occurs in the Indian fauna.

*Table of Species.**

1 (18) Labrum not spinously produced centrally.	
2 (3) Subglabrous; metanotum not striate; length 8 millim	*lævis*, Cam., p. 348.
3 (2) Punctate; metanotum distinctly striate; length at least 10 millim.	
4 (15) Notauli distinct, at least to centre of mesonotum.	
5 (6) Scutellar carinæ apically acuminate and coalesced	*intermedius*, Cam., p. 349.
6 (5) Scutellar carinæ neither acuminate nor coalesced.	
7 (12) Paler; metanotum very finely trans-aciculate.	

* *Paniscus renovatus* is omitted from this table as insufficiently described.

8 (9) Stigma distinctly infuscate; hind tarsi stramineous .... *nigriventris*, Brullé, p. 349.
9 (8) Stigma flavescent; hind tarsi not paler than tibiæ.
10 (11) Mesonotum unicolorous .... *ocellaris*, Thoms., p. 350.
11 (10) Mesonotum with three infuscate stripes .... *lineatus*, Brullé, p. 352.
12 (7) Darker; metanotum strongly strigose.
13 (14) Mesonotum unicolorous .... *testaceus*, Grav., p. 352.
14 (13) Mesonotum with four paler vittæ. *quadrilineatus*, Smith, p. 354.
15 (4) Notauli distinct at most on apical two-thirds of mesonotum.
16 (17) Thorax immaculate testaceous; metanotum sculptured ...... *orientalis*, Cam., p. 355.
17 (16) Thorax broadly flavous; metanotum glabrous .... *flavolineatus*, Cam., p. 355.
18 (1) Labrum centrally produced into an elongate spine .... *montanus*, Cam., p. 356.

244. **Paniscus lævis**, *Cam.*

Paniscus lævis, Cameron, Spol. Zeyl. 1905, p. 127 (♀).

♂ ♀. An unusually slender, pale flavous, nitidulous and almost entirely glabrous species. *Head* subimpunctate, with the clypeus apically rounded and basally not discrete; cheeks wanting; vertex obliquely constricted, but not very narrow. *Antennæ* subrufescent and not apically darker, with abnormally close and long white pubescence. *Thorax* subimpunctate, with the notauli very superficial; metasternal carina broadened basally. *Scutellum* with the carinæ not apically coalescent. *Abdomen* and *legs* immaculate; valvulæ of ♀ not black, of ♂ very large, and strongly exserted in both sexes. *Wings* hyaline, with the stigma pale flavous and the nervures blackish; nervellus intercepted close to bottom of upper fourth, and inferiorly abnormally oblique.

Length 8–9 millim.

Bengal: Chapra (Pusa coll.); Ceylon: Kandy (*E. E. Green*, type).

This species differs from all other Oriental members of this genus in being almost entirely smooth, with the head and thorax subimpunctate and the metanotum very obsoletely striate; the upper basal nervure is emitted by the median further from the lower basal, the notauli are much weaker, and the eyes, divergent below in *P. intermedius* and *P. orientalis*, are internally parallel.

It has the facies of a small and weakly developed *P. ocellaris*, but the head and thorax are subglabrous, with the punctation and striation obsolete, though hardly wanting, and the tarsi are almost white; above all, the areolet is remarkably narrow, being fully thrice as high as centrally broad, and emitting the internal cubital nervure from its centre and not, as in the latter species, from distinctly below its centre. The only male I have seen is hardly 8 millim. in length, slender and very pale; it is in the Oxford Museum and was captured in Ceylon in 1872 by Dr. Thwaites, who presented a female from the same island to the British Museum in 1867.

245. **Paniscus intermedius**, *Cam.*

Paniscus intermedius, Cameron,* Spol. Zeyl. 1905, p. 125 (♂ ♀).

♂ ♀. A fulvous species, with flavous markings. *Head* with the face, mouth and orbits pale flavous; ocellar region black; vertex not broad, obliquely and sharply constricted posteriorly. *Antennæ* red, becoming darker apically. *Thorax* subflavidous, with the pro- and meso-notum closely and very finely punctate, and the notauli distinct, discally deeply impressed; metanotum closely and transversely aciculate, basally glabrous and apically subreticulate. *Scutellum* stoutly carinate, with the carinæ acuminately convergent apically. *Abdomen* immaculate. *Legs* concolorous with the body, the anterior being the paler; second joint of hind tarsi distinctly shorter than the third and fourth united. *Wings* hyaline, with the stigma infuscate and the nervures blackish; areolet oblique and subpetiolate, with the outer nervure broadly fenestrate; second recurrent unisinuate and broadly bifenestrate; internal cubital nervure roundly and broadly curved, with no nervelet; nervellus intercepted near the bottom of its upper fourth.

Length 10–11 millim.

Punjab: Kasauli, vi. 05 (*Col. Bingham*); Ceylon: Maskeliya (*E. E. Green*, type), Pundaluoya (*E. E. Green*), Madulsima, v. 08 (*T. Bainbrigge Fletcher*).

Type in the British Museum.

This species may be recognised from all its congeners by its small size, the nervellus being intercepted at the bottom of the upper fourth and not the upper third, and by the scutellar carinæ apically coalescing into an acuminate angle, whereas in the remainder of the species they do not extend to the apex or unite; moreover, the clypeal apex is more transverse and less rounded.

246. **Paniscus nigriventris**, *Brullé.*

Paniscus nigriventris, Brullé, Hist. Nat. Ins. Hym. iv, 1846, p. 157 (♀).
Paniscus ceylonicus, Cameron, Manch. Mem. 1897, p. 31 (♀); *cf.* Spol. Zeyl. 1905, p. 127.

♂ ♀. *Head* clear flavous, with the occiput centrally fulvescent; mandibular teeth black and basally rufescent. *Antennæ* as long as body, with the scape testaceous throughout and the flagellum black, becoming piceous apically beneath. *Thorax* with very fine white pubescence; mesonotum immaculate; metathorax finely and closely, but distinctly, trans-aciculate. *Abdomen* apically infuscate; terebra 4 millim. in length. Hind tarsi stramineous, paler in the ♂. *Wings* with the stigma blackish and the nervures unicolorous black; areolet with its external nervure interrupted on the lower side; nervelet distinct; second recurrent nervure broadly bisinuate.

Length 14 to nearly 25 millim.

Bengal; Ceylon: Trincomali (*Col. J. W. Yerbury*), Diyatalawa, 4000 ft., viii. 07, and Madulsima, xii. 08 (*T. Bainbrigge Fletcher*), Kandy, v. 09 (*E. E. Green*). Sumatra. Java. Borneo.

This species is said to be allied to *P. lineatus*, Brullé, but to differ in its unicolorous mesonotum and alar nervures, and in its darker antennæ. It is similar to *P. testaceus* but is decidedly more nitidulous, smoother, and always paler, with the notauli much deeper and the stigma much darker. There is a ♂ in the Pusa collection, which certainly represents the opposite sex of this species, though the nervelet is wanting and Cameron has given the barest outline of its facies. This ♂ has the head extremely transverse with the temples practically wanting posteriorly, the stigma is very dark red, the wings peculiarly ample, the thorax and abdomen unusually slender, with the basal segment sublinear, the tarsi are white, and the lower basal nervure not much further than the upper from the base of the wing; all of which points distinguish it from the common *P. testaceus* and *P. ocellaris*. A second analogous male is in the Oxford Museum and was taken in Ceylon by Templeton.

Fig. 98.
Paniscus nigriventris, Brullé.

247. Paniscus ocellaris, *Thoms.*

Paniscus ocellaris, Thomson, Opusc. Ent. xii, p. 1199; Brauns, Arch. Nat. Mecklenb. 1889, p. 84 (♀).
Paniscus ferrugineus, Cameron, Manch. Mem. 1899, p. 107 (♀).
Paniscus testaceus, Grav. var. *ocellaris*, Kokujew, Horæ Soc. Ent. Ross. 1899, p. 135.

♂ ♀. *Head* ferruginous, with all the orbits flavous and ocellar region deep black; face strongly and closely punctate; clypeus basally less strongly and closely, its apex somewhat sparsely, punctate; mandibles apically black, palpi rufescent and with sparse white hairs. *Antennæ* blackish, with the scape and base of flagellum entirely rufescent. *Thorax* ferruginous throughout, with base and apex of the closely and strongly punctate mesopleuræ flavous; mesonotum closely but not strongly punctate, with the notauli not very deeply impressed; metanotum closely and rather strongly punctate, somewhat elongately impressed basally nearly to the pleuræ, slightly curved and laterally constricted; petiolar area basally subtrans-aciculate, but not carinate; metapleural sulcus broader and deeper below. *Scutellum* closely punctate and ferruginous, laterally subflavidous and broadly

margined, with its basal fovea deeply impressed; postscutellum laterally flavidous, with the basal half margined. *Abdomen* infuscate towards its apex, with the terebral valvulæ black. *Legs* ferruginous, with the calcaria rufescent and claws deep black; tibiæ and tarsi with dense white pubescence. *Wings* hyaline, with the stigma flavous and nervures black; basal nervure not continuous; areolet sessile.

Length 13–16 millim.

KASHMIR, 5000–6000 ft., v. 01 (*Col. Nurse*); PUNJAB: Simla, viii. 98 (*Col. Nurse*), Kangra Valley, 4500 ft., iv. 99 (*G. C. Dudgeon*); Kasauli, v. 05 (*Col. Bingham*); UNITED PROVINCES: Dehra Dun (Ind. Mus.), Sahelwa, Bahraich dist. (Ind. Mus.), Mussoori, 7000 ft., v. 05 (*E. Brunetti*), Ghoom, 7500 ft. (Ind. Mus.); SIKKIM: Darjiling, viii. 09 (*C. Paiva*—Ind. Mus.), Kurseong, 5000 ft., v. 05 (Ind. Mus.); BHUTAN, viii. 99 (*G. C. Dudgeon*); ASSAM: Khasi Hills (*Rothney*), Shillong, v. 03 (*Rowland Turner*), Ukhrul, Manipur, 6400 ft. (*Rev. W. Pettigrew*—Ind. Mus.); BENGAL: Pusa (*H. M. Lefroy*), Chapra (*Mackenzie*—Pusa coll.), Rajshai, ii. 07 (*N. Annandale*), Madhupur, x. 09 (Ind. Mus.), Calcutta, i. 06 (*Brunetti*); BOMBAY: Nadiad (Pusa coll.); MADRAS, Shevaroy Hills, 4000 ft. (Pusa coll.); CEYLON: Ohiya, 6000 ft., ix. 08, and Madulsima, xii. 08 (*T. B. Fletcher*); TENASSERIM: Dawna Hills, 2000–3000 ft., iii. 08 (*N. Annandale*). EUROPE.

The female differs from that of *P. longitarsis* in its darker colour, blackish antennæ and obsoletely trans-strigose metanotum; *P. interstitialis* is distinct in the quite continuous basal nervure and the lack of a metanotal subapical carina, though similar in the colour of the stigma, which is shared only by *P. lævis*. I hesitate to state too definitely that Cameron's species is synonymous with *P. ocellaris*, since that species is unknown to me; nevertheless no doubt can remain that *P. ferrugineus* bears exactly the same relation to *P. longitarsis*, Cam. (=*testaceus*, Grav.), that Thomson describes his species as possessing to *P. testaceus*, Holmg., *i. e.*, the coloration is paler, the average size is smaller, the ocelli are large and contiguous to the eyes with their region black, the anus is not infuscate, and the mesonotum is somewhat more nitidulous. The stigma, too, appears to be constantly flavous and not fulvous. I am by no means persuaded that Kokujew is not right in regarding the present as a mere weakly developed variety of *P. testaceus*, Grav.

Lefroy has sent me a cocoon of this species; it is cylindrical and equally obtusely rounded at both extremities, pure glossy white, not strongly shining, with a somewhat irregular black band where it begins to contract around both ends and a few irregular black marks on both apices (similar to that of the familiar *Casinaria vidua*, Grav.). Its length is 11 millim. and its breadth nearly 5 millim. in the centre. To its apex is affixed an elongate strand, or rather collection of threads, which are still entirely flexible, of 38 millim. in length, and connected with the cocoon

by an elongate and acuminate corneous process. By means of this strand it is obvious that the pendulous cocoon hangs free from a leaf, to which, in the present instance, it is still firmly fastened by three or four radiating and intertwined series of threads, greatly resembling the roots of a tree. The imago had emerged through a somewhat irregularly circular hole, excised a little on one side of the extremity furthest from the strand.

248. **Paniscus lineatus**, *Brul.*

Paniscus lineatus, Brullé, Hist. Nat. Ins. Hym. 1846, p. 157 (♀).

♀. A red species. *Head* with the orbits flavous, the face and external orbits subflavescent, and the vertex black. *Thorax* with the mesonotum subtrilobed, the lobes not very distinct and each bearing an indeterminate brunneous line; metathorax discally finely trans-striate, with the apophyses inconspicuous. *Wings* with the nervures of their basal half piceous, becoming rufescent apically; areolet externally pellucid, with its outer angle not or hardly acute.

Length 20 millim.; length of terebra 3 millim.

Bengal (*Duvaucel, teste* Brullé).

It is said to resemble the same author's *P. productus*, *P. melanopus*, and *P. rufus*, from which it may be known by the areolet being neither minute nor apically acute.

I have seen no specimens that I can attribute to this very indefinite species, the mesonotal coloration of which resembles that of *Parabatus virgatus*, Fourc.

249. **Paniscus testaceus**, *Grav.*

Ichneumon luteus, Rossi (*nec* Linn.), Faun. Etrusc. ii, 1790, p. 51; Jurine, Nouv. Méth. Class., Hym. ii, 1807, p. 2 (♀).
Paniscus testaceus, Gravenhorst, Ichn. Europ. iii, 1829, p. 626; Ratzeburg, Ichn. d. Forst. i, p. 100; ii, p. 80; iii, p. 81; Holmgren, Sv. Ak. Handl. 1854, p. 22; *op. cit.* 1858, p. 32; Brischke, Schr. Nat. Ges. Danz. 1880, p. 138; Bridgman & Fitch, Entom. 1885, p. 13; Brauns, Arch. Nat. Mecklenb. 1889, p. 84; Kokujew, Horæ Soc. Ent. Ross. 1899, p. 134 (♂ ♀).
Ophion testaceus, Lucas, Explor. Algér., Zool. iii, 1846, p. 326.
Paniscus longitarsis, Cameron,* Manch. Mem. 1899, p. 108 (♂); *cf.* Entom. 1907, p. 8.

A fulvous or testaceous species with the face and the apex of the coarsely strigose metanotum flavous. *Head* flavous; face with short infuscate, and the clypeus with much longer blackish, pilosity; epistoma circularly subprominent; mandibles with elongate pilosity, basally rufescent and apically black; palpi stramineous, elongate, and with white hairs; ocellar region black and the frons centrally rufescent, with its apical sulcus, and another above each scrobe, deeply impressed. *Antennæ* ferruginous

or testaceous, dark only at their apices. *Thorax* ferruginous, subflavidous laterally; mesonotum basally deplanate, with a conspicuous central lobe; metathorax coarsely trans-aciculate and apically flavidous with curved lateral carinæ at its apical third; its basal depression entire, centrally broad and laterally constricted; petiolar area basally carinate. *Scutellum* closely and very finely punctate, stoutly margined laterally and more narrowly at its depressed apex; postscutellum broadly impressed basally, elevated and sharply carinate centrally, with the apical margin depressed. *Abdomen* ferruginous, not or hardly darker apically; terebra as long as basal segment. *Legs* concolorous with the thorax; hind tibiæ and tarsi paler, with dense white pubescence; hind tarsi longer than usual, compared with the tibial length. *Wings* clear hyaline; stigma fulvous; nervures blackish; areolet oblique, narrow and sharply triangular above.

Fig. 99.—*Paniscus testaceus*, Grav.

Length 16–22 millim.

PUNJAB: Matiana, 8000 ft., Simla Hills, iv. 07 (*N. Annandale*); UNITED PROVINCES: Sahelwa, Bahraich district, iii. 09 (Ind. Mus.); SIKKIM (*Knyvett*—Ind. Mus.); ASSAM: Khasi Hills (type of *P. longitarsis*, Cam.), Shillong (*Rowland Turner*), Sibsagar (*S. E. Peal*—Ind. Mus.), Margherita (Ind. Mus.); BENGAL: Dacca, Pusa, and Patna (Pusa coll.), Katihar, Purneah district (*C. A. Paiva*—Ind. Mus.); BOMBAY: Bombay, vii. 72 (*D. Serra*); MADRAS: Bangalore (Ind. Mus.); BURMA: Karen Hills, 3000–3700 ft. (*L. Fea*). MALAY STATES: Penang (*Dr. Cantor*). EUROPE; NORTH AFRICA.

Differs from *P. interstitialis* in the sessile areolet and from both that species and *P. ferrugineus* in the strongly trans-strigose reticulate metanotum. I have no hesitation in synonymising these species, since I have had the opportunity of examining fifty examples captured in India, which agree entirely with the common European form; the only discrepancy is in Cameron's description, given above, and relates to the length of the scutellar lateral carinæ, but in the long series I have seen this is a very variable feature: the base alone or the whole of the side margins may be carinate. One very remarkable female in the Pusa collection has the areolet aborted, and it is obvious that the chitin that normally goes to make the submarginal nervures has run riot

in such a manner that in place of an areolet both wings bear ferruginous spots.

I have seen one male bred at Pusa, 9. xi. 06, from the larva of a Noctuid moth, *Prodenia litura*, F. There is a long series of this species in the Pusa collection taken during the first seven months of the year and in October, though by far the greater number occurred in March and April.

In Europe it is distributed from Scandinavia to Northern Africa and is an abundant species in Britain; it has been bred from a great number of hosts, representing nearly every division of the Macrolepidoptera, as well as, I think doubtfully, from three or four species of the larger TENTHREDINIDÆ.

250. **Paniscus quadrilineatus**, *Smith.*

Paniscus quadrilineatus, Smith, Scient. Res. 2nd Yarkand Mission, 1878, Hym. p. 21; C. O. Waterhouse, Aid Ident. Ins. 1885, pl. clxii, fig. 2 (♀).

♀. A red species, with the head paler and the mesonotum bearing four flavidous lines. *Head* flavous with the occiput fulvidous, eyes and ocelli black. *Antennæ* fulvidous. *Thorax* concolorous, glabrous and nitidulous; two diseal mesonotal vittæ, and another on either side, flavidous. *Scutellum* triangular with its sides elevated. *Abdomen* ferruginous-red, darker than the thorax, becoming fusco-ferruginous apically. *Legs* fulvidous. *Wings* hyaline and iridescent, with the nervures ferruginous and stigma flavous.

Length 15 millim.

CHINESE TURKESTAN: Yarkand.

The intensity of the flavous marks and the clarity of the abdominal rufescence are said by Smith to vary. Mr. Chas. O. Waterhouse tells me that the type was sent by the British Museum authorities to Calcutta. His figure (*loc. cit.*) shows that the basal nervure is not continuous through the median, and the stigma is flavous.

I here place (for lack of a better position) a female in the Calcutta Museum, captured at Margherita in Assam; it agrees very well with Fred. Smith's description, so far as that extends, and especially in the mesonotal coloration, but the stigma, which is unusually conspicuous, is deep fulvous, not flavous, and the terebra is as long as the basal segment; the specimen is remarkable and differs from any species of this genus, known to me, in the extremely small areolet, which is elongately petiolate.

251. **Paniscus renovatus**, nom. nov.

Paniscus unicolor, Smith (*nec* Smith, 1874), Scient. Res. 2nd Yarkand Mission, 1878, Hym. p. 21 (♀).

There is really little use in perpetuating this "species," since Smith's description would equally well apply to many species.

Ferruginous; head with the eyes, ocelli and apices of antennæ infuscate; abdomen falcate, glabrous and nitidulous; tarsal claws black; wings hyaline and iridescent, with the costa and stigma pale ferruginous, nervures ferruginous, areolet oblique and triangular.

Length 11 millim.

PUNJAB: Murree (*Dr. Stoliczka*).

The type was in poor condition, and was not figured by Waterhouse.

252. **Paniscus orientalis**, *Cam.*

Paniscus orientalis, Cameron, Spolia Zeylanica, 1905, p. 126 (♀).

♀. A red and almost immaculate species. *Head* with the orbits narrowly pale flavous and the ocellar region black; face strongly and closely, clypeus sparsely, punctate, with the latter broadly rounded apically. *Antennæ* dark red, becoming subinfuscate apically. *Thorax* with mesonotum subglabrous and but very finely punctate, notauli distinct only on the apical two-thirds; metanotum closely and strongly trans-striate, with the base glabrous; pleuræ closely and distinctly punctate, much more strongly than the mesonotum, with the pro- and meso-pleuræ closely, distinctly, and obliquely striate below. *Scutellum* more strongly punctate than the mesonotum, with lateral carinæ stout and not coalescing apically. *Abdomen* immaculate. *Legs* red, with the tarsal setæ elongate. *Wings* hyaline, with the stigma testaceous and the nervures black; second recurrent nervure unisinuate; nervelet wanting; nervellus intercepted slightly above its centre.

Length 13 millim.

BOMBAY: Belgaum, ix. 10 (*N. B. Kinnear*); CEYLON: Pundaluoya (*E. E. Green*, type).

Similar to, though larger than, *P. intermedius* and differing therefrom in its deeper rufescent coloration, nervellus intercepted nearer its centre, scutellar carinæ not apically coalescent, vertex broader and less obliquely constricted posteriorly, and in the metapleural carinæ being much more broadly developed, especially basally.

I have seen two specimens in the Calcutta Museum, from Knyvett's Sikkim collection, which may belong to this species, but Cameron's description is so featureless and the presumptive representatives in so bad a condition that it is impossible to reconcile them with any degree of certainty.

253. **Paniscus flavolineatus**, *Cam.*

Paropheltes flavolineatus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1907, p. 111 (♀).

♀. A flavescent luteous species, with centrally broad abdomen. *Head*, except occiput and temples, flavous; upper mandibular

tooth elongate, the lower indistinct and subapical; clypeus strongly and determinately discrete, broad and apically truncate; eyes large, internally emarginate and parallel; cheeks wanting; temples distinct and posteriorly rounded; occiput transverse, with the ocelli large and not contiguous to the eyes. *Antennæ* pale, with the third joint longer than fourth, the first flagellar but slightly longer than the scape. *Thorax* very finely but distinctly punctate, nitidulous and testaceous-red, with the prothorax apically, two broad mesonotal vittæ, callosities beneath radix, a broadly curved mark on mesopleuræ, metapleuræ apically and below, flavous; notauli obsolete and very short; metanotum glabrous, with no carinæ, spiracles elongate. *Scutellum* broadly flavous and emarginate laterally. *Abdomen* testaceous-red and somewhat dilated centrally, with the third and the compressed following segments infuscate; the two basal gradually somewhat widened throughout and glabrous, with no sulcus and their spiracles inconspicuous; terebra blackish and shorter than the basal segment. *Legs* immaculate testaceous, with the claws closely and elongately pectinate. *Wings* clear hyaline and iridescent; stigma and costa stramineous; areolet oblique and triangular; recurrent nervure fenestrate, and continuous with the external submarginal; internal cubital broadly curved, with indications of the nervelet beyond its centre; lower basal emitted distinctly beyond upper basal; nervellus postfurcal and intercepted very distinctly above its centre.

Length 9 millim.

PUNJAB: Ferozpur, iii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

So far from representing a new genus, the type is extremely closely allied to *Paniscus fuscicornis*, Holmg., and especially to *P. brachycerus*, Thoms., but is larger, with conspicuous flavescent markings; Cameron has been led into error by entirely overlooking the strong and very obvious tarsal pectination. He adds that "from the large size of the eyes and more particularly of the ocelli and from the pale coloration I have no doubt that the species is nocturnal."

254. **Paniscus montanus**, *Cam.*

Paniscus montanus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 291 (♀).
Paniscus kashmirensis, Cameron,* *op. cit.* p. 292 (♀).

♂ ♀. A red species. *Head* with the orbits broadly, face, the basally discrete clypeus and basal half of mandibles, flavous; ocellar region black; upper half of face broadly longitudinally sulcate, its centre distinctly and broadly prominent. *Thorax*: metanotum closely and strongly trans-striate, its apical declivity glabrous and basally striate, with stout lateral carinæ which

approximate basally; basal metanotal impression narrow, curved and glabrous; pro- and meso-pleuræ closely and finely punctate; metapleuræ closely and obliquely striate, with the spiracular areæ, except at their base, more strongly and obliquely striate; basal half of metasternal carina roundly broadened, and marked above by a few transverse carinæ. *Wings* hyaline, with the costa and stigma testaceous, nervures black; submarginal nervures sub-coalescent in front, the external broadly fenestrate below and there almost continuous with the second recurrent, which is thence abruptly and broadly curved outward; nervelet minute.

Length 14–17 millim.

KASHMIR, 5000–6000 ft., v. 05 (*Col. Nurse*); MADRAS: Bangalore (Ind. Mus.).

Type ♀ in Col. Nurse's collection, also that of *kashmirensis*.

P. testaceus "is paler, more yellowish in colour, the striation on the metapleuræ and spiracular region is much weaker and may be almost obsolete, the apex of the metanotum is irregularly striated, not smooth; the face wants the longitudinal furrow" (*Cameron*).

Unfortunately Cameron has entirely overlooked the peculiar feature of this species, which is its very remarkably elongate and acuminate central labral spine; this is as long as the unusually exserted labrum, which in turn is hardly shorter than the clypeus. In other respects it might easily be confused with *P. testaceus*, with which its facies exactly corresponds.

Cameron has been at some trouble to differentiate *P. kashmirensis*, but his distinctions are certainly not specific, especially since the labral structure is identical; the separation of the clypeus and basal metanotal impression are also identical, and the petiolar lateral carinæ are traceable in both, though stronger in *P. montanus*; the nervelet is also but slightly more developed; the fenestræ of the second recurrent are identical and the nervelet from it, mentioned by him, is entirely adventitious and exists in one wing only; such plastic features as the epistomal sulcus and the density of the metanotal sculpture are of little value in such unstable insects as are those of the present genus.

Genus **PARABATUS**, *Thoms.*

Parabatus, Thomson, Opusc. Ent. xii, 1888, p. 150.

GENOTYPE, *Ichneumon virgatus*, Fourc.

This genus is little more than a subdivision of *Paniscus* and bears the same facies. Therefrom it is at once recognised by the upper and lower basal nervures being continuous through the median, the genal and occipital carinæ being entirely wanting and the terebra often subconcealed.

Range. Cosmopolitan.

Table of Species.

1 (2) Nervellus of hind wing intercepted distinctly above centre .... *virgatus*, Fourc.
2 (1) Nervellus intercepted at its centre .... *amplus*, Morl.

255. Parabatus virgatus, *Fourc.*

Ichneumon virgatus, Fourcroy, Entom. Paris. ii, 1785, p. 401; de Villers, Linn. Ent. iii, 1789, p. 204.
Ophion virgatum, Gravenhorst, Nov. Act. Acad. Nat. Curios. 1818, p. 295.
Paniscus virgatus, Gravenhorst, Ichn. Eur. iii, 1829, p. 625; Newport, Trans. Linn. Soc. xxi, 1852, p. 71, pl. viii, figs. 13–19; Holmgren, Sv. Ak. Handl. 1858, p. 32; Bridgman & Fitch, Entom. 1885, p. 13 (♂ ♀).
Parabatus virgatus, Thomson, Opusc. Ent. xii, 1888, p. 1197; Brauns, Arch. Nat. Meckl. 1889, p. 80; Bridgman, Trans. Ent. Soc. 1889, p. 420; Kokujew, Horæ Soc. Ent. Ross. 1899, p. 136, *note* (♂ ♀).
Paniscus interstitialis, Cameron, Manch. Mem. 1899, p. 106 (? ♂).

♂ ♀. A pale red species, with the head flavous and the mesonotum often more or less infuscate. *Head* pale, with the palpi and mandibles rufescent, and the teeth of the latter black; face closely but not strongly punctate, and, like the clypeus, with short white hairs; apex of clypeus with long ferruginous hairs; vertex blackish only between the basal ocelli. *Antennæ* elongate, unicolorous red and very sparsely pilose. *Thorax* pale; mesonotum sometimes infuscate, with the central, or all three, lobes dark, but the notauli always pale; metathorax convexly deplanate basally, its apex centrally elevated, its sides slightly depressed and bordered posteriorly by a stout and curved carina; metanotum not distinctly trans-aciculate; all the pleuræ smooth, shining and flavescent, with the metapleural sulcus broad and deeply impressed; mesosternum sometimes deep black. *Scutellum* ferruginous and often laterally paler; postscutellum roundly oblique at both extremities. *Abdomen* testaceous and not strongly constricted at the base, often subinfuscate apically. *Legs* rufescent; coxæ, trochanters and hind tibiæ stramineous in ♂. *Wings* clear hyaline, with the costa and stigma flavidous; nervures basally black, becoming paler apically; areolet oblique, narrow, subelongate, and shortly but distinctly petiolate, with its outer nervure pellucid throughout its lower half; second recurrent nervure continuous with outer nervure of areolet, pellucid to its extreme base, as well as below its centre, and very strongly curved outwardly throughout; basal nervure continuous through the median; nervelet wanting; nervellus intercepted at its upper third or fourth.

Length 10–14 millim.

PUNJAB: Simla, 7000 ft., iv. 07 (Ind. Mus.); SIKKIM: Kurseong, 6000 ft., v. 09, and Gangtok, 6150 ft., ix. 09 (Ind. Mus.); ASSAM: Khasi Hills (*Rothney*). EUROPE.

This is a very abundant species throughout the Palæarctic region, and it had already been recorded from the Oriental by

Kokujew in his 'Hymenoptera Asiatica Nova,' when Cameron described it as new from Assam. I have no hesitation in synonymising his name, since the description he gives differs in no way from that of *P. virgatus*, auctt. It has frequently been bred, always from Lepidoptera, and its hosts comprise many kinds of Bombycids, Noctuids, and Geometrids (*cf.* Bridgman & Fitch, *l. c.*).

The Oriental specimens differ in no way from those taken in Britain.

256. **Parabatus amplus**, *Morl.*

Parabatus amplus, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 131.

♂ ♀. A somewhat stout, red species, with the wings flavescent and very ample, the thorax entirely subinfuscate and the second recurrent nervure straight.

Fig. 100.—*Parabatus amplus*, Morl.

Length 15–19 millim.

TIBET: Yatung, 4500 ft. (*A. E. Hobson*, type); SIKKIM (*Knyvett*—Ind. Mus.).

Type in the British Museum.

Too closely allied to the preceding species to demand a detailed description, but at once recognised therefrom by its larger size and wings, which are strongly flavescent and peculiarly ample, with the recurrent nervure hardly at all curved, the upper basal much less curved and the lower basal emitted very slightly before, in place of very slightly beyond, the upper, as is the case in *P. virgatus*; the metathorax is more deplanate and the nervellus intercepted in its centre. Similar to *P. gansuanus*, Kok., from China, but with the metathoracic costæ strong, and the stigma red and of normal breadth.

Genus **TETRAGONALYS**, *Morl.*

Tetragonalys, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 132.

GENOTYPE, *T. barbarica*, Morl.

Head strongly constricted behind the internally parallel and (next the scrobes) strongly emarginate eyes, which are hardly broader than the thorax; clypeus subconvex, discrete basally, and apically margined and very broadly rounded; mandibles stout, with the apical teeth of equal length; palpal joints elongate and cylindrical; frons strongly deplanate below the prominent ocelli, which are laterally contiguous to the eyes; vertex very narrow and basally bordered throughout. Antennæ as long as the body, filiform and apically subattenuate. Thorax not very stout, sub-

glabrous and strongly nitidulous, with obsolete notauli; metanotal areæ usually complete, with the areola hexagonal and not longer than broad, apically truncate, emitting distinct costulæ near its base; basal area very narrow and parallel-sided; petiolar area strongly discrete; spiracles elongate-oval. Scutellum convex, glabrous, nitidulous, and immarginate. Abdomen half as long again as head and thorax, glabrous, becoming compressed and subpilose from centre of the third segment; basal segment sublinear, with central, very prominent disco-lateral spiracles; second but slightly shorter, nearly twice as long as broad, with prominent spiracles before its centre; third with subcentral and less protuberant spiracles; anus compressed, with distinctly exserted styles. Legs slender and subelongate, with the inner claw only of each tarsus closely pectinate. Wings hyaline and very ample; basal nervure antefurcal (*i. e.*, the upper basal intercepts the median nervure distinctly beyond the lower basal); discoidal nervure strongly curved with no nervelet; anal emitted from centre of brachial cell; areolet not small, obliquely subquadrate and very shortly but distinctly petiolate; basal not longer than half the sinuate apical abscissa of the radius; nervellus intercepted below its centre and curved above.

Range. Himalayas.

In its remarkable subquadrate areolet and anal styles this genus appears to fill an evident gap in our system, between the MESOCHORIDES and the remainder of the OPHIONINÆ; its affinities, however, are entirely with the PANISCIDES.

257. **Tetragonalys barbarica**, *Morl.*

Tetragonalys barbarica, Morley, *loc. cit.*

♂. A somewhat large and brightly nitidulous testaceous species, with only the head (except the mouth), a dot behind the tegulæ,

Fig. 101.—*Tetragonalys barbarica*, Morl.

and the tarsal claws, black; pronotum and stigma stramineous; anal styles as long as second hind tarsal joint.

Length 14 millim.

TIBET: Gyangtse, vi. 04 (*H. J. Walton*).
Type in the British Museum.
Described from a single specimen.

Genus PARCA, *Morl.*

Parca, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 133.

GENOTYPE, *P. ocularia*, Morl.

Head very strongly transverse, broader than the thorax, with the unusually prominent eyes very remote from the extremely small and closely contiguous ocelli; vertex acute; frons and face strongly deplanate and subglabrous; clypeus basally discrete, apically margined and subtruncate; mandibles apically unidentate and obtuse; palpi very slender. Antennæ setaceous and hardly longer than the body; scape broader than long and very broadly excised apically. Thorax subglabrous and strongly nitidulous, with the notauli very deeply impressed, transversely crenulate, and discally coalescent; metanotum with a strong and entire central, and lateral traces of a petiolar, transverse carina; spiracles elongate-oval and large; sternauli deeply impressed. Scutellum not longer than basally broad, nor convex, with its sides entirely immarginate. Abdomen sublinear, not at all compressed and very finely shagreened from centre of second segment; basal segment glabrous and very little widened apically, with the somewhat prominent spiracles hardly before its centre; thyridii subdorsal and remote from base of second segment; terebra as long as basal segment. Legs elongate and slender; intermediate tibiæ with the two calcaria equal; claws small and not at all pectinate. Wings not ample, hyaline; areolet entirely wanting; both abscissæ of radius straight; second recurrent nervure emitted only slightly beyond the very slightly curved internal cubital; submarginal nervure obsolete; nervelet wanting; upper basal nervure emitted from the median distinctly further from the base of the wing than the lower basal; nervellus strongly postfurcal and intercepted but slightly above its centre.

Range. Ceylon.

Its deplanate abdomen, subcentral petiolar spiracles, entire lack of an areolet, basally straight external radial abscissa, simple claws, small ocelli and protuberant eyes, render this genus very remarkable. It is probably most closely related to *Opheltoideus*, Ashm. (Proc. U.S. Nat. Mus. 1900, p. 95), which is the only genus of this tribe with no areolet and contains but a single MS. species, without locality; but the present genus is very different in the conformation of the scutellum, which is not unusually convex and margined neither at base nor apex.

258. **Parca ocularia**, *Morl.*

Parca ocularia, Morley, *loc. cit.*

♀. A strongly nitidulous, slender and testaceous species with

only the eyes, ocelli, mandibular apices, flagellum, terebral valvulæ, hind tarsi, stigma and costa, black; anus and the hind femora and tibiæ subinfuscate; metanotum glabrous, mesopleuræ punctate.

Length 11 millim.

CEYLON: Kandy, vi. and ix. 09 (*E. E. Green*, *O. S. Wickwar*).

Type in the author's collection.

Fig. 102.—*Parca ocularia*, Morl.

Tribe *OPHIONIDES*.

This tribe consists of large red insects, with strongly elongate antennæ and legs; throughout Europe they are among the best known of all ICHNEUMONIDÆ on account of their frequent attraction to light after dark. Their discrimination from the rest of the OPHIONINÆ is rendered extremely simple by the fact that the second recurrent nervure is emitted from the cubitus distinctly before the submarginal, a feature shared only by the NOTOTRACHIDES, in which the antennæ are peculiarly short and the intermediate tibiæ have but a single calcar. One or two genera of the ANOMALIDES have the second recurrent and submarginal continuous through the cubitus, but never with the submarginal postfurcal: moreover their tarsi are broad and the metathorax produced.

The species of *Henicospilus* are entirely cosmopolitan in their range, but *Ophion* is somewhat more restricted, though very widespread. Schmiedeknecht remarks (Opusc. Ichn.) that he has taken numerous specimens of both genera in Java, but failed to find any sharp structural or colorational distinctions between them and the European forms; he very truly adds that the distinctions are so elusive that unconnected descriptions of single specimens, such as are brought forward by Cameron, in scattered periodicals, only tend to augment the difficulty of monographing the group.

The Indian species of *Ophion* appear few in individuals; but a single specimen has, to the best of my knowledge, been taken with

any certainty in Ceylon, and the species are recorded mainly from Assam and the extreme north-west, where so many Palæarctic Ichneumonids have recently been discovered. In the somewhat extensive collection from Pusa there is not a single *Ophion*, its place being apparently taken by the closely allied *Henicospilus*; while, on the other hand, Col. Nurse failed to capture a single *Henicospilus* about Simla, Quetta or in Kashmir, where *Ophion* is frequent.

In their habits these insects are almost exclusively nocturnal, though they may be disturbed among undergrowth by day and will then career away on the wind at a great pace, much in the manner of the Crane Flies (*Tipula*); they come freely to artificial light in houses and have not uncommonly been captured by lepidopterists on "sugar"; they are nearly omnivorous among Lepidoptera and may often be bred from their own chitinous and cylindrical cocoons, spun within their hosts' pupæ. (For a fuller account of this tribe, *cf.* my "Revis. Ichn. Brit. Mus." 1912.)

Table of Genera.

1	(4)	First cubital cell normally setiferous throughout.	
2	(3)	Radial nervure not basally incrassate. .	OPHION, F., p. 363.
3	(2)	Radial nervure more or less incrassate basally	PLEURONEUROPHION, [Ashm., p. 372.
4	(1)	First cubital cell with a large glabrous area below the radius.	
5	(8)	Glabrous alar area with no corneous marks.	
6	(7)	Mandibles vertical; body very stout. .	ALLOCAMPTUS, [Thoms., p. 373.
7	(6)	Mandibles horizontal; body very slender	STAUROPODOCTONUS, [Brns., p. 375.
8	(5)	Glabrous alar area with one or more corneous marks.	
9	(10)	Mandibles horizontal; size very large .	ORIENTOSPILUS, Morl., [p. 378.
10	(9)	Mandibles vertical; size normal.	HENICOSPILUS, Steph., [p. 380.

Genus **OPHION**, *Fab.*

Ophion, Fabricius, Ent. Syst., Suppl. 1798, p. 210.

GENOTYPE, *Ichneumon luteus*, L.

A genus of large and slender red insects, with no alar areolet and the second recurrent nervure emitted from the first cubital cell, which is uniformly setiferous and bears no corneous marks. Head short and transverse, rounded posteriorly; clypeus basally indistinctly discrete and apically truncate, with distinct lateral foveæ; labrum subprominent; eyes internally emarginate, and ocelli very large. Antennæ flavidous red and not shorter than the body, filiform, very slender and apically subattenuate. Mesonotum

glabrous, with distinct notauli; metanotum usually with two transverse carinæ, sometimes centrally obsolete, and rarely with the discal areæ entire. Scutellum, at least basally, carinate at the sides. Abdomen strongly compressed, petiolate, with the basal segment narrow and its spiracles beyond the centre; second segment shorter, with deeply impressed thyridii; terebra shortly exserted. Legs elongate and slender, with the tarsi often paler. Wings ample, with the basal and discoidal nervures distinctly convergent; first cubital geniculate below, usually with a distinct nervelet; parallel nervure emitted above; nervellus intercepted at or below its centre; first abscissa of radius basally curved and longer than the recurrent nervure in hind wing.

Range. World-wide.

One or two species, described by the older authors under this generic name, are still treated of here, though their true position, at present unknown, is certainly elsewhere.

Table of Species.

1	(20)	Thorax and head not entirely black.	
2	(19)	Antennæ not entirely black.	
3	(10)	Second recurrent nervure not emitted opposite apex of basal radial abscissa.	
4	(9)	Second recurrent emitted before apex of basal radial abscissa.	
5	(8)	Petiolar area not laterally carinate; length over 15 millim.	
6	(7)	Apophyses normal, not elongate	*luteus*, L., p. 365.
7	(6)	Apophyses both acute and elongate ..	*dentatus*, Smith, p. 366.
8	(5)	Petiolar area entire and discrete; length under 15 millim.	*areolatus*, Cam., p. 366.
9	(4)	Second recurrent emitted beyond apex of basal radial abscissa	[p. 367. *bicarinatus*, Cam.,
10	(3)	Second recurrent emitted opposite apex of basal radial abscissa.	
11	(16)	Head posteriorly normal.	
12	(13)	Basal nervure continuous; inner cubital basally straight	*carinatus*, Cam., p. 368.
13	(12)	Basal nervure not continuous; internal cubital nervure basally curved.	
14	(15)	Mesonotum not infuscate; scutellum basally carinate	*asiaticus*, Kok., p. 369.
15	(14)	Mesonotum discally infuscate; scutellum not carinate	[p. 369. *fuscomaculatus*, Cam.,
16	(11)	Head posteriorly buccate.	
17	(18)	Head, thorax and abdomen broadly white-marked....................	[p. 370. *albopictus*, Smith,
18	(17)	Head, thorax and abdomen not white-marked	*quettaensis*, Cam., p. 371.
19	(2)	Antennæ entirely black	*generator*, F., p. 371.
20	(1)	Thorax and head entirely black	*triangularemaculatus*, [Mots., p. 372.

It is hoped that the above table will be found of use in the

elucidation of our species, though the difficulty of finding constant characters in those of this genus has always been acknowledged, and has been by no means minimised by recent authors. Cameron's descriptions are none too explicit; Smith's are inadequate; and the old species of Motschulsky and especially of Fabricius are nowadays altogether unintelligible, and very probably assignable to other genera.

259. **Ophion luteus**, *L.*

Ichneumon luteus, Linnæus, Syst. Nat. ed. 10, 1758, p. 566; Berkenout, Outl. Nat. Hist. Brit. i, 1769, p. 166; Fabricius, Syst. Ent. 1775, p. 341; id. Sp. Ins. i, p. 435; id. Mant. Ins. i, p. 268; id. Ent. Syst. ii, p. 178; Fourcroy, Ent. Paris. ii, 1785, p. 400.
Ichneumon vinulæ, Scopoli, Ent. Carn. 1763, p. 286; Christ, Naturg. Ins. 1791, p. 367.
Ichneumon fulvus, Retzius, Gen. Spp. Ins. 1783, p. 68.
Ophion luteus, Fabricius, Ent. Syst., Suppl. 1798, p. 235; id. Syst. Piez. 1804, p. 130; Gravenhorst, Ichn. Eur. iii, 1829, p. 692; Ratzeburg, Ichn. d. Forst. i, p. 102; ii, p. 79; iii, p. 80; Holmgren, Sv. Ak. Handl. 1858, p. 12; Vollenhoven, Pinac. pl. xxviii, fig. 1; Bridgman & Fitch, Entom. 1884, p. 178; Thomson, Opusc. Ent. xii, 1888, p. 1190; Brauns, Arch. Nat. Meckl. 1889, p. 90 (♂ ♀).
Joppa lutea, Panzer, Krit. Revis. ii, 1806, p. 66.
Ophion vinulæ, Dale, Ann. Nat. Hist. vii, 1844, p. 60.

♂ ♀. A somewhat large, testaceous-red and nitidulous species. *Head* distinctly constricted posteriorly; orbits broadly flavescent, ocelli subcontiguous to the eyes, cheeks short. *Thorax* without distinct flavous markings; metathorax with the anterior transverse carina very distinct, the posterior somewhat strong laterally but centrally obsolete and there traversed by two longitudinal carinæ which approach the anterior carina. *Abdomen* sometimes apically infuscate; basal segment not constricted centrally, the postpetiole not very distinctly discrete; second distinctly impressed at thyridii, with its lateral spiracles not prominent. *Legs* with tibial calcaria of unequal length. *Wings* with stigma testaceous and nervures black; nervelet usually elongate; basal nervure not quite continuous through median, and the nervellus intercepted at its centre.

Fig. 103.—*Ophion luteus*, L.

Length 15–20 millim.

TIBET: Gyangtse, 13,000 ft., vi. 04 (*H. J. Walton*); PUNJAB;

Simla, 7000 ft., v. 07 (*N. Annandale*); SIKKIM (*Knyvett*—Ind. Mus.). EUROPE. TURKESTAN.

The coloration of this species is liable to considerable variation, more especially as regards the paler and often flavescent markings; such plastic features as the metathoracic carinæ, scutellar margins and length of the nervelet are also inconstant.

This is one of the most prevalent of all ICHNEUMONIDÆ throughout nearly the whole of Europe, but has not hitherto been known to extend further east; it very frequently flies into houses to artificial light, is found on "sugar" by lepidopterists, and may frequently be remarked flying with an uneven undulatory motion about hedges and in woods. A very long list of hosts has been assigned to it by Bridgman and Fitch (*loc. cit.*), which has been extended by later authors; its parasitism is confined to Lepidoptera, and is practised almost exclusively among the Bombycid and Noctuid moths.

260. **Ophion dentatus**, *Smith.*

Ophion dentatus, Smith, Scient. Res. 2nd Yarkand Mission, 1878, Hym. p. 22; C. O. Waterhouse, Aid Ident. Ins. xxv, 1885, pl. clxii, fig. 3 (♀).

♀. A red or pale ferruginous species, with the metathorax coarsely trans-strigose and laterally spinose. *Head* with the eyes, ocelli and apices of the mandibles, black. *Thorax* with the mesonotum smooth and nitidulous; metathorax with two arcuate transverse carinæ, the apical at the base of the petiolar area and laterally produced into acute apophyses. *Abdomen* falcate, glabrous and shining, with fine and short silky pubescence. *Wings* hyaline and iridescent.

Length 17 millim.

KASHMIR: Sind Valley (*Dr. Stoliczka*, type); SIKKIM (*Knyvett*—Ind. Mus.).

Waterhouse's figure is too rough to assist in determining the position of this species to any material extent, though the alar neuration as there indicated shows the second recurrent to be emitted before the apex of the basal radial abscissa, which allies it with *O. luteus*, but the apophyses render it sufficiently distinct.

I have seen a male, captured in Sikkim, which differs from *Ophion luteus*, L., only in its slightly more prominent apophyses.

261. **Ophion areolatus**, *Cam.*

Ophion areolatus, Cameron, Manch. Mem. 1899, p. 101 (?♂).

♂. General colour testaceous-red. *Head* not constricted posteriorly; orbits broadly and the vertex pale flavous, occiput and the finely punctate face yellowish ferruginous; clypeus finely and distinctly punctate, basally discrete, with deep and oblique lateral sulci; mandibles glabrous, centrally punctate, basally flavous, with

the teeth black. *Thorax* laterally flavous; notauli broad and deeply impressed; metanotum basally with a broad, deep and semicircular impression, beyond "this is a transverse keel, from which run two stouter keels to the apex; from the middle of these runs a stout, curved keel to the middle of the base of the petiole; there being inside this an oblique keel; the whole forming a central and two lateral areæ"; pleuræ nitidulous and impunctate, with a broad and deep central mesopleural impression, and thence obliquely sulcate to the hind coxæ. *Scutellum* flavous and glabrous, not laterally carinate; postscutellum distinctly carinate basally, obliquely sloping to the gradually widened apex. *Abdomen* immaculate. *Legs* flavous. *Wings* clear hyaline with the stigma fulvous and nervures black; basal nervure not continuous through the median; second recurrent nervure emitted distinctly before the apex of the basal radial abscissa, rendering the apex of the cubital cell longer below than above.

Length 13–15 millim.

TIBET: Yatung; (*A. E. Hobson*); PUNJAB: Simla, iv. 07 (*Col. Nurse*); ASSAM: Khasi Hills (*Rothney*, type).

Type in the Oxford Museum.

This is a distinct species, easily known from *O. fuscomaculatus* by the apically areated metathorax, etc. Apparently allied to *O. mocsaryi*, Brauns (Arch. Nat. Mecklenb. xliii, p. 89), though with the areæ apical and not discal.

I have seen a male referred to this species by Cameron, in Col. Nurse's collection, differing from the original description, given above, in having the orbits, vertex and mandibular base immaculate; the metanotum is scabrous and nitidulous with the two longitudinal discal carinæ apparent only at the apex; the "central and two lateral areæ" represent the discrete petiolar area and are not discal but apical, nor are they at all distinct; the scutellum is very finely punctate; the abdomen subinfuscate apically, its basal segment is remarkably constricted centrally before the distinct postpetiole; second segment with the thyridii very deeply impressed, the third also basally constricted.

This species is said by Mr. E. P. Stebbing in his notes on Indian insects (Journ. Bombay Nat. Hist. Soc. xvi, p. 684) to be parasitic upon the Noctuid moth *Acronycta major*, Brem. (=*ancedina*, Butl.).

262. Ophion bicarinatus, *Cam.*

Ophion bicarinatus, Cameron, Spolia Zeylanica, 1905, p. 120 (♀).

♀. A dark red species, with the orbits broadly, face, scutellum and pleuræ, pale flavous. *Head* with the face very finely punctate, and the clypeal foveæ large and deeply impressed. *Antennæ* pale red. *Thorax* impunctate; mesonotum with dark pubescence, the notauli distinct and extending to its centre; "the depression at the base of the metanotum is deep, roundly narrowed towards the

apex; its width at the base longer than the total length; . . . on the apical slope of the metanotum, commencing at the transverse keel, are two stout longitudinal keels; the sides of the apical slope are bordered by a stout waved keel, which extends to the base of the hind coxæ." *Wings* hyaline, with the costa and stigma red, and the nervures darker; recurrent nervure emitted twice the length of the submarginal nervure beyond the apex of the basal radial abscissa; nervelet as long as the transverse cubital nervure.

Length 21 millim.

CEYLON: Maskeliya (*E. E. Green*).

This species is said to be much larger than any of its congeners known from India in 1905; to have the metanotal carinæ as in *O. areolatus*, which possesses the basal metanotal impression semicircular and not distinctly apically dilated, as in the present species, which is also larger than *O. fuscomaculatus* and readily known therefrom by the second recurrent nervure not being emitted opposite the end of the basal radial abscissa. The mesonotum is stated to be occasionally subinfuscate linearly. I have not seen this species, which appears, with the exception of the cubital venation, to correspond closely with *Ophion luteus*, L.; it is the only species of the genus recorded with any certainty from so far south as Ceylon.

263. **Ophion carinatus**, *Cam.*

Ophion carinatus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 275 (♀).

♀. A somewhat large, testaceous-red and nitidulous species. *Head* very little constricted posteriorly; orbits broadly flavescent, ocelli subcontiguous to eyes, cheeks short. *Thorax*: metathorax with the anterior transverse carina not at all distinct, the posterior hardly obsolete centrally and thence emitting two longitudinal carinæ to apex. *Abdomen* hardly darker and not infuscate apically; basal segment not constricted centrally, the postpetiole not distinctly discrete; second but little impressed at the thyridii, with its lateral spiracles somewhat prominent and very obvious from above. *Legs* with the tibial calcaria of unequal length. *Wings* with the stigma testaceous and nervures black; nervelet elongate; basal nervure continuous through the median, and the nervellus intercepted at its centre.

Length 17 millim.

BALUCHISTAN: Peshin, iv. 03 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species is most remarkably similar to *O. luteus*, L., and perhaps no more than a form of it. It differs, however, in having the first cubital cell less acute apically, the internal cubital nervure quite straight below the nervelet, and its apex, beyond the recurrent nervure, exactly as long as the submarginal nervure, whereas in *O. luteus* it is basally curved below the

nervelet and its apex, beyond the recurrent, is distinctly longer than the submarginal; the radius, too, is apically more sinuate, the nervellus less postfurcal, the head slightly broader posteriorly and the basal nervure continuous through the median.

264. **Ophion asiaticus**, *Kok.*

Ophion asiaticus, Kokujew, Rev. Russe Entom. 1906, p. 167 (♀).
Ophion peshinensis, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 275 (♀, as ♂).

♀. A not very large, flavo-testaceous and nitidulous species. *Head* somewhat broad posteriorly; orbits broadly stramineous, ocelli subcontiguous to the eyes, cheeks very short. *Antennæ* shorter than the body. *Thorax*: mesonotum smooth and shining, with the notauli short and deeply impressed; metathorax with anterior transverse carina not very strong, the posterior subobsolete, traces of two discal and apical longitudinal carinæ. *Scutellum* very smooth and nitidulous, with its base alone laterally carinate. *Abdomen* flavescent, with the second to sixth segments dorsally testaceous and the anus not infuscate; basal segment subparallel-sided throughout, with its petiole pale stramineous; second segment basally constricted, with deeply impressed thyridii, and the central spiracles but slightly prominent. *Legs* with the tibial calcaria of unequal length; tarsi finely spinulose and elongately pectinate. *Wings* with the stigma rufescent and basally stramineous, and the nervures black; nervelet short; basal nervure not quite continuous through the median, and the nervellus intercepted at its centre.

Length 15–18 millim.

BALUCHISTAN: Peshin, iv.03 (*Col. Nurse*, type); DECCAN (*Col. Sykes*). PERSIA. TRANSCASPIA. TRANSCAUCASIA.

Type of *O. peshinensis* in Col. Nurse's collection.

This species is said to be closely allied to *O. obscurus*, Fab., but with the antennæ shorter and stouter, the thorax more shining, and the pale markings less profuse. The pale petiole will distinguish it from *O. carinatus*, than which it is smaller and more ochreous, with the internal cubital nervure distinctly a little sinuate before the shorter nervelet; the second segment is basally more constricted and the metanotum smoother, though the conformation of the radial nervure, the nervellus and apex of the first cubital cell is the same.

Cameron's type of *O. peshinensis* differs from Kokujew's description in nothing but the subcontiguous ocelli, and I have no hesitation in synonymising it therewith.

265. **Ophion fuscomaculatus**, *Cam.*

Ophion fuscomaculatus, Cameron, Manch. Mem. 1899, p. 99 (?♂).

♂♀. *Head* with face and clypeus not discrete, circularly prominent centrally and ferruginous, becoming subflavidous at

the eyes; occiput and external orbits pale flavous, with the vertex darker and the mandibular teeth black. *Antennæ* ferruginous, becoming darker towards their apices. *Thorax* pale fulvescent flavous; mesonotum darker, with its central lobe mainly infuscate and not distinctly discrete from the lateral; metanotum with no transverse striæ, but with a distinct central transverse carina, whence two weaker carinæ extend to the apex and enclose a longitudinally aciculate petiolar area, or the indistinct "depression in the middle at the base is broader than its length, narrowed to a point in the middle at the apex and longitudinally striated in the middle; across the middle of the median segment is a stout transverse keel, behind which, in the centre, is a shallow depression; the apex of the segment oblique, the middle finely longitudinally striated"; pleuræ glabrous and nitidulous. *Scutellum* nitidulous, glabrous and pale flavous, with its sides not carinate above; postscutellum distinctly convex, apically obliquely sloping; frenum striate. *Abdomen* ferruginous, with the first segment basally paler. *Legs* concolorous with the thorax. *Wings* hyaline, with the stigma fulvous and the nervures black; basal nervure not quite continuous through the median; second recurrent nervure emitted opposite the apex of the basal radial abscissa, rendering the abruptly triangular apex of the first cubital cell of equal length above and below.

Length 15 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

This species is said to agree with *O. univittatus*, Brullé, in bearing a brunneous mesonotal band; but the metathorax is not covered with fine and curved striæ, etc., as in that species.

There is a large male of 22 millim. in the National Collection, captured during July 1895 by G. C. Dudgeon, in Bhutan, which agrees very well with this description, excepting that the abdomen is black from the fourth segment: coloration is, however, known to be inconstant in this genus. A female in the British Museum, from Quetta, also seems to be referable to this species.

266. **Ophion albopictus**, *Smith.*

Ophion albopictus, Smith, Scient. Res. 2nd Yarkand Mission, 1878, Hym. p. 22; C. O. Waterhouse, Aid Ident. Ins. pl. clxii, fig. 4 (♀).

♀. *Head* white with the mandibles rufescent, the eyes and ocelli black. *Antennæ* red. *Thorax* rufescent, with two discal mesonotal vittæ, the lateral sutures and numerous pleural spots below the wings white. *Scutellum* also white. *Abdomen* red, with some pale whitish lateral spots towards the anus; two basal ventral segments white. *Wings* hyaline and iridescent, with the nervures ferruginous and the stigma pale red.

Length 13 millim.

Kashmir (*Dr. Stoliczka*).

The rough figure in Waterhouse's 'Aid' shows the occiput truncate, the head subbuccate and laterally subparallel behind the eyes; no pale markings are, however, indicated; the "white" scutellum is ochreous, and the three discal mesonotal vittæ entire and infuscate; the terebra is not exhibited and the wings are very ample.

This species appears to differ from *O. quettaensis* in little but its distinctive coloration.

267. **Ophion quettaensis**, *Cam.*

Ophion quettaensis, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 275.

♀. A somewhat small, testaceous and nitidulous species, with flavous markings. *Head* entirely stramineous, subbuccate and posteriorly as broad and as long as the eyes, from which the black ocelli are remote; cheeks somewhat short. *Antennæ* not longer than the body. *Thorax*: mesonotum laterally and discally flavescent; metanotum strongly infuscate apically, with a very strong anterior and obsolete posterior transverse carina, but no longitudinal carinæ. *Scutellum* not laterally carinate. *Abdomen* testaceous, with the sides of the dorsal segments below, and the basal half of the first segment, flavescent; anus not infuscate; basal segment slightly but distinctly constricted a little beyond its centre; thyridii of second hardly impressed, its spiracles not prominent, but the sides strongly margined throughout. *Legs* with the tarsal claws nearly straight and elongately pectinate. *Wings* with the stigma flavescent and the nervures black; nervelet short; basal nervure not continuous through the median, and the nervellus intercepted at its centre.

Length 12 millim.

Baluchistan: Quetta, iv. 02 (*Col. Nurse*).

Type in Col. Nurse's collection.

At once recognised from all other species of this genus by the peculiarly broad vertex (not noted by Cameron), which is almost broader and no narrower longitudinally than the eyes, viewed from above; the internal cubital nervure is a little curved before the nervelet and its apical abscissa, beyond the recurrent nervure, is as long as the submarginal.

I have taken the above description from the type, which Cameron erroneously records from Peshin.

268. **Ophion generator**, *F.*

Ophion generator, Fabricius, Syst. Piez. 1804, p. 135; Olivier, Encycl. Méth., Ins. viii, 1811, p. 513.

Ichneumon generator, Thunberg, Mém. Ac. Sc. Pétersb. 1822, p. 259; id., Mém. Ac. Sc. Pétersb. 1824, p. 307; *cf.* Vallot, Mém. Ac. Sc. Dijon, 1836, p. 244.

"*Ophion* flavus antennis nigris, alis hyalinis immaculatis. . . .

Reliquis minor. Caput totum flavum antennis solis nigris. Alæ totæ hyalinæ. Abdomen breve, truncatum." (*Fabricius.*)

Olivier (*loc. cit.*) simply copies the short diagnosis of Fabricius, given above, adding only that the species is smaller than *Ophion pennator*, F.; that the antennæ are black; the head and remainder of the body flavous; the abdomen short and truncate; the wings entirely transparent; and that it is found in the "East Indies." To this Thunberg adds nothing. It is certainly not an *Ophion* in the present acceptation of the genus; possibly it is to be sought among the PORIZONIDES.

"Habitat in India orientali. Dom. Daldorff, Mus. dom. de Sehestedt."—*Fab.*

"Bred from *Noctua persicariæ* by Vallot."—*Dalla Torre.*

269. **Ophion triangularemaculatus**, *Mots.*

Ophion triangularemaculatus, Motschulsky, Bull. Soc. Nat. Moscou, 1863, p. 20 (♂ et ? ♀).

A slender, narrow and shining species. *Head* subdeplanate, strongly nitidulous and black, with the eyes large, convex and infuscate; ocelli very distinct. *Antennæ* blackish, basally pale testaceous and a little shorter than the body, with the basal joint ovately inflated and the second very short, subtransverse. *Thorax* black, elongate, attenuate and narrower than the head; mesonotum subglobose, glabrous and longitudinally impressed obliquely on either side; metanotum obtuse. *Abdomen* subparallel-sided, black, with a triangular pale testaceous discal mark on each of the three central segments; basal segment elongate, subclaviform; anus compressed and hardly dilated. *Legs* pale testaceous, with the hind tibiæ infuscate, their tarsi black, and their femora subincrassate. *Wings* with stigma and nervures black.

Length 4 millim.

CEYLON: Nuwara Eliya and Mt. Patannas (*Motschulsky*).

Its author adds that the breadth of the head is a third of a line; and indicates what he considers may be the female, differing in having the apices only of the abdominal segments with testaceous margins. It is certainly not here placed in its correct genus, which is impossible of determination from the inadequate description.

Genus **PLEURONEUROPHION**, *Ashm.*

Pleuroneurophion, Ashmead, Proc. U.S. Nat. Mus. 1900, p. 86.

Labrum of normal length; ocelli not small. Internal cubital nervure sharply geniculate; nervelet distinct; first cubital cell with no corneous marks; radius incrassate, and not bisinuate,

basally; basal nervure not continuous through median; nervellus intercepted far below its centre.

Range. Hawaii, Ceylon.

This genus was founded upon a MS. species from Hawaii; the following is the only one ever published as appertaining to it, and even here certain discrepancies lend some doubt as to whether it really belongs to the genus.

Respecting the Indian species, Cameron says (Spol. Zeyl. 1905, p. 121):—"Except that there can hardly be said to be a stump of a nervure on the disco-cubital nervure, this species fits into *Pleuroneurophion*. It has the thickened base of the radius of that genus and of *Enicospilus*, but it wants the horny points found always in the latter genus."

270. Pleuroneurophion erythrocerus, *Cam.*

Pleuroneurophion erythrocerus, Cameron, Spolia Zeylanica, 1905, p. 121 (♀).

♀. *Head* pale flavous, with the ocellar region not black. *Antennæ* subrufescent. *Thorax* pale testaceous, with the mesonotum subrufescent; pro- and meso-thorax closely punctate, with the propleuræ obscurely striate; metanotum with broadly rounded striæ, except at its glabrous base, where the impression bears two stout and several indistinct striæ; metapleural carinæ broad, slightly reflexed centrally, and rounded at both base and apex. *Abdomen*, except basally, rufescent-testaceous, becoming darker apically. *Legs* testaceous, with the anterior pairs paler. *Wings* hyaline, with the stigma testaceous and the nervures blackish; disco-cubital nervure centrally thickened and elongately fenestrate; its basal abscissa slightly rounded downwards at the apex, and the apical abscissa slightly but distinctly longer than the basal abscissa of the cubital. which is a little shorter than the recurrent nervure; nervelet subobsolete; radial nervure basally thickened; glabrous area wanting; basal nervure not continuous through median; nervellus intercepted far below its centre.

Length 14–15 millim.

CEYLON: Peradeniya (*E. E. Green*).

Unknown to me.

Genus ALLOCAMPTUS, *Thoms.*

Allocamptus, Thomson (*nec* Först.), Opusc. Ent. xii, 1888, p. 1186.
Cymatoneura, Kriechbaumer, Zeits. Hym.-Dip. 1901, p. 22.

GENOTYPE, *Ophion undulatus*, Grav.

This genus is closely allied to *Henicospilus* and has the base of the radial nervure similarly thickened, but the very obvious glabrous alar area is destitute of corneous marks, with the result that it has but quite recently been accorded generic rank apart

from *Ophion*. From the latter it is at once known by the very strongly bisinuate base of the radius, elongately antefurcal nervulus and nervellus, the traces of areæ on the mesopleuræ, apically broadly subexcavate metanotum, which is transversely strigose; the mesosternum is granulosely punctate, apically immarginate, with a fovea below the punctate speculum.

Table of Species.

1 (2)	Nervelet wanting; metanotal striæ strong	*sinuatus*, Morl.
2 (1)	Nervelet distinct; metanotal striæ weak	*inflexus*, Morl.

271. Allocamptus sinuatus, *Morl.*

Pleuroneurophion malayanus, Cameron, Journ. Str. Br. R. Asiat. Soc. 1905, p. 122, ♀ (*nec* Cameron, *op. cit.* 1902, p. 50).
Allocamptus sinuatus, Morley, Revis. Ichn. Brit. Mus. 1912, p. 24 (♂ ♀).

♂ ♀. A large testaceous species, with only marks at base of front wings behind tegulæ black, and in ♀ the third segment, with anus, indeterminately blackish. *Head* very narrow behind the eyes. *Antennæ* 25 millim. in length. *Thorax:* metathorax distinctly but not very strongly trans-striate, with the striæ laterally all equally strong. *Scutellum* margined to near its apex. *Wings* with a distinct glabrous area in the first cubital cell, the base of the radial dark, strongly bisinuate and the costa of both wings, together usually with the stigma, black.

Fig. 104.—*Allocamptus sinuatus*, Morl.

Length 25–30 millim.

PUNJAB: Kangra Valley, 4500 ft., vii. 99 (*G. C. Dudgeon*); BENGAL: Calcutta, iii. 94 (Ind. Mus.); ASSAM: Sadiya (*Col. Godwin-Austen*); BURMA: Moulmein, 1843 (*Archdeacon Clerk*), Karen Hills, 3000–3700 ft. (*L. Fea*); CEYLON: Pattipola, ii. 09 (*O. S. Wickwar*), Namunakule, 6600 ft., ii. 10, and Peradeniya, iii. 10 (*E. E. Green*).

Type in the Oxford Museum.

This species is very like *A. undulatus*, Grav., but is larger and paler, with the antennæ and two basal segments longer and distinctly more slender, the stigma narrower and nearly always darker, emitting the radius more obliquely and less directly; the internal cubital nervure is geniculate a little before and not distinctly beyond its centre, as in the latter species, which has its

basal half less sinuate and two especially prominent lateral metathoracic carinæ.

The type was captured by Thwaites in Ceylon in 1873. A female was bred in the Calcutta Museum from the larva of a moth, *Trabala vishnu*, found on a castor-oil tree in that city; it emerged from its host on 26th March, 1894.

272. **Allocamptus inflexus**, sp. n.

♂ ♀. A large, pale testaceous species, the only black marks being at the base of the front wings behind the tegulæ. *Head* narrow behind eyes. *Thorax* with the metathorax finely and not very distinctly trans-striate, with the striæ laterally all equally strong. *Scutellum* margined. *Wings* with a distinct glabrous area in first cubital cell, the base of the radial nervure testaceous, strongly bisinuate, and the costa and stigma testaceous.

Length, ♀ 27 millim.; ♂ 17 millim.

Central India (*Hearsey*, type); Ceylon: Kandy, vi. and vii. 09 (*E. E. Green*).

Type ♀ in the Oxford Museum.

This species differs from *A. sinuatus* in its shorter and stouter basal segment, more finely striate metathorax, distinct nervelet, much shorter first discoidal cell, testaceous costa and stigma, with the latter much broader and emitting the concolorous radius less obliquely and more directly. It is extremely like *A. undulatus*, Grav., but I am able to distinguish it by the posteriorly very much more narrowed head, the less basally sinuate and testaceous radial nervure and the distinct nervelet, which is emitted from the geniculate centre of the first cubital nervure, whereas in the latter species it is geniculate, with no nervelet distinctly beyond the centre; the angle at which the stigma emits the radius and the conformation of the basal segment is the same in both.

The male differs from the female in nothing but its much smaller size and more slender conformation; it closely resembles *Henicospilus flavicaput*.

Genus **STAUROPODOCTONUS**, *Brauns* (emend.).

Stauropoctonus, Brauns, Arch. Nat. Meckl. 1889, p. 93; Morley, Revis. Ichn. Brit. Mus. 1912, p. 16.
Spilophion, Cameron, Spol. Zeyl. 1905, p. 124.

Genotype, *Ophion bombycivorus*, Grav.

Clypeus apically transverse; labrum prominent, apically roundly constricted and often longer than half the clypeus. Abdomen strongly compressed and more than double the length of the head and thorax. Transverse cubital nervure angled shortly but distinctly below the centre; disco-cubital nervure roundly and broadly curved, rising before the discoidal nervure; nervelet

wanting; basal nervure continuous through the median; base of radius thickened; glabrous area distinct, but often immaculate.

Range. Europe, Rhodesia, Ceylon, South India, Panama.

Cameron points out that his genus is allied to *Pleuroneurophion* and *Henicospilus* in the basally thickened radial nervure, though differing from the former in the continuous basal nervure and broadly rounded disco-cubital nervure, and from the latter in the (occasional) absence of corneous marks in the glabrous alar area and in the nervellus being intercepted (occasionally) above the centre. The somewhat uncommon *Ophion bombycivorus*, Grav., is the typical species and has been repeatedly bred from the Lobster Moth, *Stauropus fagi*, L., in Britain and Germany. The presence of an infumate spot, considered characteristic of the genus by Cameron, cannot exclude the following species from Prof. Sigismund Brauns' genus (in Opusc. Ichn., they are separated solely on the comparative length of the labrum), the composition of which has been corrected by Kriechbaumer (Zeits. Hym.-Dipt. 1901, p. 22).

Table of Species.

1 (2) Nervellus geniculate above centre; stigma black .... *orientalis*, Morl.
2 (1) Nervellus geniculate below centre; stigma stramineous .... *biumbratus*, Morl.

273. Stauropodoctonus orientalis, *Morl.*

Spilophion maculipennis, Cameron, Spolia Zeylanica, 1905, p. 125, pl. B, fig. 13 (♀) (*nec* Biolog. Centr.-Amer. 1886, p. 292).
Stauropodoctonus orientalis, Morley, Revis. Ichn. Brit. Mus. 1912, p. 18.

♂ ♀. An ochraceous species, broadly marked with black and flavous. *Head* glabrous and nitidulous, testaceous, with the face, mouth and orbits flavous. *Antennæ* testaceous red. *Thorax* with three large and narrowly separated mesonotal vittæ, apex of metanotum, a large and basally obliquely constricted mark on the basal half of the mesopleuræ, and a large suboval mark on the metapeuræ, black; pro- and meso-thorax impunctate; metanotum glabrous before the transverse carina; the base depressed, sometimes with two stout discal carinæ; the disc beyond the transverse carina with three or four longitudinal carinæ; the petiolar area strongly regularly trans-striate, its sides obliquely and strongly striate, with the striæ clearly separated; the apical slope is somewhat widely and irregularly striate; pleuræ smooth and nitidulous. *Scutellum* laterally carinate to near its apex. *Abdomen* testaceous, with the third segment discally, and most of the fifth and sixth, black. *Wings* hyaline, with the radial cell basally infumate: stigma and nervures black, with the former

basally pale; glabrous area present, but with no corneous marks; basal abscissa of radius basally thickened; disco-cubital nervure

Fig. 105.—*Stauropodoctonus orientalis*, Morl.

roundly curved downwards, its apex broadly and roundly curved upwards.

Length 15–20 millim.

BOMBAY: Bombay (*R. R. Holmes*); CEYLON: Peradeniya (*E. E. Green*, type); FORMOSA (*A. E. Wileman*).

Type in the British Museum.

The examples that I have seen exactly agree with Cameron's description in every way, excepting in having the labrum no longer than half the clypeus and the nervellus intercepted at its centre.*

No doubt can remain that this species is congeneric with *S. bombycivorus*, Grav., from which it differs in its basally infumate radial and subapically infumate first cubital cells, in the basally much more strongly inflexed internal cubital nervure, in having the nervellus more strongly postfurcal and intercepted a little lower, the radial nervure of the hind wing much more strongly sinuate basally, with its recurrent nervure appreciably nearer the apex of the wing; the scutellum and metanotum are less rugulose, and the former laterally carinate nearly to its apex; the eyes are equally emarginate, and the ocelli large, in both species.

274. **Stauropodoctonus biumbratus**, *Morl.* (Plate I, fig. 10.)

Stauropodoctonus biumbratus, Morley, Revis. Ichn. Brit. Mus. 1912, p. 18 (♂ ♀).

♂ ♀. An ochraceous species, broadly marked with black and

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* Cameron's description exaggerates these two points, which are identical in all the specimens (including the type) that I have examined.

flavous; wings with two infumate fasciæ and corneous marks, stigma stramineous and the nervellus intercepted below its centre.

Length 20 millim.

MADRAS: Utakamand.

Type in the Indian Museum.

Extremely closely allied to the preceding species, but at once recognised by the two conspicuous corneous alar marks in the pellucid radial area, which is bounded at both extremities of the stramineous stigma by a distinctly subinfumate mark, the metathorax is darker, the nervellus geniculate far below its centre, the apical half of the two basal segments are determinately, and the remainder of the abdomen vaguely, blackish.

Genus **ORIENTOSPILUS**, *Morl.*

Orientospilus, Morley, Revis. Ichn. Brit. Mus. 1912, p. 6.

GENOTYPE, *O. individuus*, Morl.

A genus of very large insects uniting the characters of *Henicospilus* and *Allocamptus*, but differing from all other ICHNEUMONIDÆ, except *Stauropodoctonus*, with which I am acquainted in having the mandibles horizontal and not vertical. Radial nervure basally straight, incrassate, and laterally infumate; first cubital cell with a distinct glabrous area, and with corneous marks; metanotum rugose, with no distinct transverse striæ; body broadly marked with black.

Range. Ceylon, Assam.

This genus has the facies of *Stauropodoctonus*, but the glabrous area bears corneous marks; in fact, it appears to have the same relationship to it that *Henicospilus* has to *Ophion*, and if it is agreed to regard the two latter genera as distinct the present must be separated from *Stauropodoctonus*, though on equally superficial and artificial characters. Although Cameron examined the mandibles of *O. reticulatus*, he does not appear to have noticed their peculiar horizontal position, nevertheless his description, though somewhat superficial, and especially so in respect to the venation, agrees entirely with the specimens for which I erected this genus, since they are obviously not congeneric with *Henicospilus*, and no other genus bears corneous alar marks.

275. **Orientospilus individuus**, *Morl.*

Orientospilus individuus, Morley, Revis. Ichn. Brit. Mus. 1912, p. 6 (♀).

♀. Somewhat stout, bright testaceous and nitidulous, with the eyes, ocelli, the hardly attenuate antennæ except apically beneath, and the hind tarsi deep black; wings strongly fulvescent, with their apical margin from the apex of the disco-cubital cell in nearly a straight line to just within the apex of the nervure emitted from

nervellus, translucent black; an additional black streak runs from the anal angle of the front wings to an oval blotch extending from the fulvous stigma to the centre of the lower side of the disco-cubital cell. *Head* with the vertex broad and hardly narrower than the somewhat small eyes. *Scutellum* distinctly carinate laterally only, and sparsely punctate. *Thorax*: metathorax shagreened, with no trace of areæ; the postpetiole becomes abruptly nearly double the breadth of the petiole; anal valvulæ blackish. *Legs* short and stout, testaceous, with the hind tarsi conspicuously black and rather broad; all the femora with long hairs beneath. *Wings* broad and not very ample, with the nervures concolorous with the markings; upper basal straight and strongly antefurcal, disco-cubital acutely geniculate, but with no ramellus; nervellus subopposite and intercepted a little above its lower third.

Length 17 millim.

BOMBAY: Deesa, ix. 01 (*Col. Nurse*).

Type in Col. Nurse's collection.

A remarkable species in its strong superficial resemblance to Oriental Bracons.

276. Orientospilus reticulatus, *Cam.*

Enicospilus reticulatus, Cameron (*nec* Cam. 1902), Manch. Mem. 1899, p. 102 (♀).

♂ ♀. *Head* fulvous, with the distinctly punctate face paler and the ocellar region black; clypeus indistinctly punctate and apically glabrous; mandibles basally closely punctate, with their teeth black; palpi fulvous, with dense elongate white pilosity. *Antennæ* longer than the body, unicolorous flavous; scape punctate and with sparse pale hairs; flagellum with dense and very short dark pubescence. *Thorax* fulvous, with three large mesonotal, and two large mesosternal, black marks; the metanotum basally "is obliquely depressed at the base and apex; the centre at the base has a long central, bordered by a shorter keel and the edges by a curved one; the apical part smooth and without any keels. The smooth basal part of the median segment is bordered by a curved keel; in front of this the segment is stoutly irregularly reticulated to the apex; in the middle at the base are two straight

Fig. 106.
Orientospilus reticulatus, Cam.

narrow keels; the centre beyond these bordered by a much stouter keel; the central bordered area has, at the top, two or three stout transverse keels; the apex is smooth;" pro- and meso-pleuræ pilose and trans-aciculate, with the apical sulcus of the latter crenulate and its apex obscurely striate below; metapleuræ sinuately carinate centrally and more strongly below, with the intervening space stoutly and subobliquely striate. *Scutellum* basally closely and finely punctate, longitudinally aciculate and densely pilose; transcarinate before the darker and closely aciculate apex; basal fovea broad and deeply impressed, bordered by an elongately pilose carina; postscutellum indistinct, and stoutly carinate laterally. *Abdomen* fulvous, with the third segment (except at its lower third), and the remainder or three apical ones entirely, black; fourth rarely paler than first. *Legs* unicolorous fulvous and densely pilose. *Wings* hyaline, with a single circular or inferiorly abruptly dilated corneous spot in the glabrous area; nervures and stigma black; basal abscissa of the radius thickened.

Length 30–32 millim.

ASSAM: Khasi Hills (*Rothney*, type), Sylhet; CEYLON (*Dr. Thwaites*—Oxford Mus).

Type in the Oxford Museum.

In the specimens I have examined the radius is distinctly infumate basally, and the region of the black ocelli is not blackish.

Genus HENICOSPILUS, *Steph.*

Enicospilus, Stephens, Ill. Mandib. vii, 1835, p. 126.
Allocamptus, Förster (*nec* Thomson), Verh. pr. Rheinl. 1868, p. 150.

This genus differs from *Ophion* solely in the presence of corneous marks upon the glabrous disc of the first cubital cell, which will at once distinguish it from the whole remainder of the ICHNEUMONIDÆ, excepting only *Orientospilus*, and the radial nervure appears to be constantly thickened basally. The former is, as Bridgman and Fitch have remarked (Entom. 1884, p. 177), "a very unstable character, and not of generic value, although included as only a convenient division of the species of *Ophion*."

For long the genus had a most precarious existence and was not recognised by Holmgren, Desvignes, Kirchner, or the older Continental authors; but it was accepted by Marshall in both his catalogues, by Thomson in 1888, and subsequent authors have usually admitted it to generic rank, more often without the necessary aspirate, conclusively accorded it by Marshall (Ent. Annual, 1874, p. 129), though still denied by Schmiedeknecht (Opusc. Ichn.).

In describing Indian species of this genus, Cameron remarks (Manch. Mem. 1897, p. 24), "*Enicospilus*, or *Henicospilus* as the purists would have it, differs from *Ophion* proper in the fore wings having a clear space, which usually contains one or more horny

points; and the stump of the cubital nervure, found well developed in *Ophion*, is absent. In some cases the smooth space is present without having horny points in it, or they are very faint. In either case I believe it will be found that the base of the cubital nervure is thickened, which is not the case with *Ophion*, *sensu str.* In view of the great similarity of the species of *Ophion*, it seems to me desirable to adopt *Enicospilus* as a distinct genus. Species belonging to it are found in all parts of the world." Later, however (*op. cit.* 1899, p. 102), he sinks it as a mere subgenus of *Ophion*, from which he regards it as differing in the thickened basal radial abscissa and the corneous plates of the glabrous alar area, or it would be more correct to say, in the mere possession of such a glabrous area, with or without corneous spots.

Table of Species.

1	(2)	Cubital cell with four corneous marks	*ceylonicus*, Cam., p. 382.
2	(1)	Cubital cell with at most two corneous marks.	
3	(18)	Cubital cell with two corneous marks.*	
4	(9)	Base of radius distinctly deflexed and slightly thickened.	
5	(8)	Mesopleuræ and scutellum striate; head flavous throughout.	
6	(7)	Stigma, costa, and often sternum black	*univittatus*, Brul., p. 383.
7	(6)	Stigma and sternum bright fulvous	*flavicaput*, Morl.,† p. 384.
8	(5)	Mesopleuræ and scutellum finely punctate; orbits flavous	*rufus*, Tosq., p. 385.
9	(4)	Base of radius not deflexed, though usually thickened.	
10	(11)	Alar corneous marks connected by a corneous line	*unilineatus*, Cam., p. 386.
11	(10)	Alar corneous marks with no corneous connecting line.	
12	(13)	Mesonotum and most of abdomen nigrescent or black	*hariolus*, Morl., p. 387.
13	(12)	Mesonotum and most or whole of abdomen testaceous.	
14	(17)	Third discoidal cell short and broad; stigma not black.	
15	(16)	Basal nervure not continuous through the median nervure ..	*reticulatus*, Cam., p. 388.
16	(15)	Basal nervure continuous through the median	*merdarius*, Grav., p. 389.
17	(14)	Third discoidal cell normal; stigma black	*melanocarpus*, Cam., p. 390.

* These are sometimes absent in *H. univittatus*, Brul.

† *H. pungens*, Smith, differs from this species in not having its discoidal nervure distinctly geniculate, &c.

18 (3) Cubital cell with at most one corneous mark.	
19 (24) Mesonotum blackish or with black markings.*	
20 (23) Antennæ mainly black.	
21 (22) Submarginal nervure of same length as second recurrent	*atricornis*, Morl., p. 391.
22 (21) Submarginal nervure two-thirds length of second recurrent	*spilonotus*, Cam., p. 392.
23 (20) Antennæ unicolorous flavous	*striatus*, Cam., p. 392.
24 (19) Mesonotum entirely pale.	
25 (26) Corneous alar mark linear; radius basally bisinuate	*orientalis*, sp. n., p. 393.
26 (25) Corneous alar mark pyriform or triangular; radius basally straight.	
27 (30) Body normal; metathorax strongly transcarinate; corneous mark pyriform.	
28 (29) Submarginal nervure curved	*dasychiræ*, Cam., p. 394.
29 (28) Submarginal nervure straight ..	*horsfieldi*, Cam., p. 394.
30 (27) Body short and stout; metathorax not transcarinate; corneous mark triangular	*crassus*, Morl., p. 395.

277. Henicospilus ceylonicus, *Cam.*

Enicospilus ceylonicus, Cameron, Manch. Mem. 1897, p. 23 (♀).

♀. *Head* fulvous, with the face subflavidous, mandibles apically black, and palpi testaceous; ocelli very large and elevated, with the basal subcontiguous to the eyes. *Antennæ* unicolorous fulvous and longer than the body, with short pubescence; scape glabrous. *Thorax* flavous; mesonotum nitidulous; metathorax basally "depressed in the middle; a stout transverse keel behind it; behind this keel the segment is coarsely shagreened and with an indistinct furrow down the centre;" pleuræ coarsely shagreened. *Scutellum* pale flavous. *Abdomen* flavous, darker towards the apex. *Legs* unicolorous fulvous. *Wings* clear hyaline, with the stigma fulvous; "the clear bare space contains one large horny mark, with a distinct dark border; above it is a curved spot, and behind two smaller spots;" cubital nervure much thickened at its base.

Length 15 millim.

CEYLON: Trincomali (*Col. J. W. Yerbury*).

I have seen no specimen, among the hundreds examined, which I could place here; the insect remains a mystery to me and I suspect some slip or misprint in Cameron's description of the numerous alar corneous marks.

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* Except *H. atricornis*, Morl., var. *zeylanicus*, nov., which has a minute additional spot.

278. **Henicospilus univittatus**, *Brul.*

Ophion univittatus, Brullé, Hist. Nat. Ins. Hym. 1846, p. 146 (? ♂).
Enicospilus nigronotatus, Cameron,* Journ. Str. Br. Roy. Asiat. Soc. 1903, p. 133 (♀).
Henicospilus univittatus, Morley, Revis. Ichn. Brit. Mus. 1912, p. 45 (♂ ♀).

♂ ♀. A large ferruginous-red species, with a single infuscate mesonotal vitta. *Head* posteriorly constricted with the occiput and the whole of the uneven face flavidous, the latter centrally prominent and apically hardly discrete from the convex and elongate clypeus. *Thorax* closely and finely punctate, testaceous, with the central only of the three indistinct mesonotal lobes bearing a black or brunneous band and the mesosternum sometimes concolorous; metathorax finely and arcuately trans-strigose throughout, with no more indication of a basal area than is given by the absence of striation. *Abdomen* dull ferruginous, with the apical half infuscate; terebra not extending beyond the anus and the ♂ valvulæ large. *Legs* normal and testaceous throughout. *Wings* with the nervures stout, very dark indeed, and the stigma infuscate-ferruginous; internal cubital nervure centrally arcuate and the radial basally bisinuate; cubital cell bearing a hyaline space containing two or no corneous dots.

Fig. 107.—*Henicospilus univittatus*, Brul.

Length 25–30 millim.

Assam (*Mrs. Evans*); Ceylon (*Col. J. W. Yerbury, E. E. Green*). Malay States: Singapore (*H. N. Ridley*); Ding-ding Islands; Sarawak; New Guinea.

Type of *H. nigronotatus* in the British Museum.

Neither size nor sex is indicated by Brullé, whose type lacked its abdomen. The hyaline area of the cubital cell places this species, indubitably I think, in the present genus and not, as it has hitherto been treated, in *Ophion* proper. Supposing this to be the case, I have seen a single pair which agrees in every way with the original description, enabling me to elaborate it as above and certainly synonymise it with Cameron's female. This species is evidently closely allied to *H. flavicaput*, from which it is easily, but apparently only, known by the strongly infuscate alar costa and stigma.

279. **Henicospilus flavicaput**, *Morl.*

Eniscospilus xanthocephalus, Cameron (*nec* Cameron, 1905), Ann. Nat. Hist. xix, 1907, p. 178 (♀).
Henicospilus flavicaput, Morley, Revis. Ichn. Brit. Mus. 1912, p. 45 (♂ ♀).

♂ ♀. An immaculate luteous species. *Head* unicolorous flavous. *Thorax* with the metanotum stoutly and distinctly striate, basally glabrous, with a single short stria in its centre, lateral striæ basally longitudinal and straight but towards the apex obliquely sinuate to pleuræ, basal impression stoutly and sparsely striate, striæ of apical slope roundly curved from side to side; propleuræ finely and obliquely striate centrally; mesopleuræ longitudinally and distinctly striate on their basal half. *Scutellum* with the basal half glabrous and the apical closely and longitudinally aciculate; its sides distinctly carinate throughout. *Abdomen* and *legs* immaculate. *Wings* hyaline, with stigma testaceous and nervures black; glabrous area with two corneous marks, the basal large and broad with its base transverse and constricted above, thence gradually and roundly narrowed to a fine point at the apex, the apical mark close to centre of basal radial abscissa, elongate and narrow, roundly curved towards radius; disco-cubital nervure broadly and but slightly curved at its apex, which is remote from apical abscissa of radius: base of radius broadly deflexed.

Length 27 millim.

Central Provinces: Jabalpur, iii. 98 (*Col. Nurse*); Bombay: Kasaba, 855 ft., vii. 04 (Pusa coll.); Ceylon (*Templeton*—Oxf. Mus.); Tenasserim: Haundraw Valley (*Col. Bingham*, type).

Cameron simply differentiates this species from *H. reticulatus* and *H. striatus* by its duplicated corneous alar marks, making no reference to those of similar conformation among the remaining species; but its large size, stout build, and especially the basally distinctly sinuate radial nervure, render it sufficiently distinct and ally it with the genus *Allocamptus*, Thomson. Especially is this the case with two females captured in Ceylon by the Rev. T. Wenham in 1845 (in the British Museum) and by Dr. Thwaites in 1873 (in the Oxford Museum), which have the radius distinctly bisinuate basally, the metathorax more regularly and stoutly transstriate, the glabrous alar area with but a single corneous mark and the colour ochraceous. I propose to call this form var. **sinuatus**, though it is quite possibly of specific rank.

280. **Henicospilus pungens**, *Smith.*

Ophion pungens, Smith,* Trans. Ent. Soc. Lond. 1874, p. 396 (♂, as ♀).
Henicospilus pungens, Morley, Revis. Ichn. Brit. Mus. 1912, p. 46 (♂ ♀).

♂ ♀. It is not impossible that my *H. flavicaput* is a variety of this species, from which it differs in its distinctly geniculate

discoidal nervure, longer and stouter antennæ and the large, entirely immaculate, glabrous alar area.

Length 18 millim.

Assam (*W. F. Badgley*). Singapore (*H. N. Ridley*); Japan: Hiogo (type).

Type ♂ in the British Museum.

281. **Henicospilus rufus**, *Tosq.*

(?) *Ophion rufus*, Brullé, Hist. Nat. Ins. Hym. iv, 1846, p. 149.
Ophion (*Enicospilus*) *rufus*, Tosquinet, Ichn. d'Afrique, 1896, p. 378 (♂ ♀).

♂ ♀. A stout and red species, sparsely punctate and pubescent. *Head* rufescent, broader than long and strongly constricted posteriorly; orbits entirely flavous and close to the eyes on the vertex; frons concave and smooth; face a little convex, smooth, with somewhat long white pilosity; clypeus not discrete and laterally somewhat deeply impressed, smooth and subnitidulous, with its apex broadly rounded; mandibles basally rufescent and apically piceous; palpi fulvous; eyes strongly emarginate internally. *Antennæ* red, longer than body and setaceous; scape elongate and the basal flagellar joint slightly longer than the second. *Thorax* ovoid, red and shortly pilose; mesonotum convex, finely punctate, with no notauli; mesopleuræ finely and closely punctate; metathorax posteriorly rounded and produced beyond the base of the hind coxæ, with its disc traversed by a transverse carina, dividing the short, horizontal and finely punctate basal part from the very large, sloping and sinuately trans-aciculate apical region; spiracles basal, linear and very large. *Scutellum* elongate, somewhat narrow, discally convex, with obsolete punctation and laterally margined nearly to its apex. *Abdomen* thrice as long as the head and thorax, strongly compressed, red, smooth and shortly pilose, with the segments laterally and apically infuscate; basal segment narrow and very elongate, with the petiole thrice as long as the postpetiole, which is discally convex; second segment somewhat shorter and apically subcompressed; terebra black and somewhat stout. *Legs* fulvous and very long; hind tibiæ much longer than their femora and the basal joint of their tarsi thrice as long as the second; claws piceous and pectinate. *Wings* ample and hyaline; stigma and radix fulvous, tegulæ red, nervures apically darker; radial cell elongate and somewhat narrow; radial nervure basally sinuate and slightly thickened; of the two corneous spots in the cubital cell, the internal is the larger and subtriangular with its apex produced and curved, the external is small and linear; the ordinary transverse nervure is antefurcal and the nervellus intercepted well below its centre by a nervure extending to the margin of the wing.

Length 25 millim.

Northern India (*Capt. Reid*); Assam: Khasi Hills (*Col. Godwin-Austen*), Margherita and Sibsagar (*S. E. Peal*—Ind. Mus.):

TENASSERIM: Mergui (*W. Doherty*—Ind. Mus.); CEYLON (*P. N. Braine*, *Mrs. Horne*). CHINA; JAVA; BOURBON; AFRICA.

I have followed Tosquinet in the diagnosis of this species, which I consider, in its original form, to have been a medley of several, since Brullé says (*loc. cit.*): "J'ai réuni sous ce même nom d'*Ophion rufus* plusieurs individus de localités assez différentes, comme l'on voit, et qui ne se distinguent que pas des caractères que je n'ai pas trouvés suffisants pour constituer des espèces bien définies," though the neuration was by no means identical. He makes no mention of the basally sinuate radial nervure, which renders the present species closely allied to *H. flavicaput*, as well as to the genus *Allocamptus*.

Paniscus perforator, Smith (Ann. Nat. Hist. xvii, 1876, p. 449, ♀) from Rodriguez, has been entirely erroneously synonymised with this species by Dalla Torre; its genus is correctly assigned by Fred. Smith and I have examined the type in the British Museum collection.

There is in the British Museum a very large Ceylonese female of 30 millim. with the radial cell basally infumate, the radius basally less sinuate and the external cubital mark lunate; but probably it constitutes a distinct species. This species has been bred by Dr. Watt, on 11th September 1897, from *Dasychira mendosa*, Hübn. (*cf.* Report No. XIV: Tea Pest).

282. **Henicospilus unilineatus**, *Cam.*

Enicospilus unilineatus, Cameron, Spolia Zeylanica, 1905, p. 123 (♀).

♂ ♀. A pale testaceous species, with sparse black markings. *Head* pale flavous, shining and impunctate; apex of clypeus broadly

Fig. 108.—*Henicospilus unilineatus*, Cam.

rounded. *Antennæ* red, with the scape and ten or eleven basal flagellar joints blackish. *Thorax* pale testaceous, with the meso-

sternum and a broad mesonotal stripe deep black; mesonotum nitidulous, with pale pubescence; metanotum basally glabrous, irregularly and transversely striate laterally, and centrally strongly reticulate, its apical slope with a few strong and irregularly curved striæ; propleuræ glabrous, indistinctly and obliquely striate below, mesopleuræ closely and finely punctate, metapleuræ finely rugulose with a few strong oblique striæ above. *Scutellum* laterally carinate on its basal half. *Abdomen* pale testaceous, with the second segment and apex of first rufescent, the third and following infuscate. *Legs* concolorous with the thorax; femora rufescent. *Wings* hyaline, with nervures and stigma black; glabrous area with two corneous marks, the basal pyriform, the two marks connected by a corneous line, the apical small and quadrate.

Length 17–26 millim.

MADRAS: Kulattupuzha, Travancore, xi. 08 (*N. Annandale*): CEYLON: Paradeniya (*E. E. Green*, type; *O. S. Wickwar*), Kandy, vi. 09 (*E. E. Green*), Maskeliya, iii. 09 (*T. B. Fletcher*).

283. **Henicospilus hariolus**, *Morl.*

Henicospilus hariolus, Morley,* Revis. Ichn. Brit. Mus. 1912, p. 44 (♂ ♀) [there erroneously attributed to Cameron].

♂ ♀. A profusely black-marked ochreous species. *Head* whitish stramineous and strongly constricted posteriorly; face and clypeus strongly nitidulous and glabrous, with the former alone closely and finely punctate, the latter apically truncate and not basally separated, with the lateral impressions very deep; labrum normally exserted; mandibles testaceous and vertical, with the teeth black. *Antennæ* longer than the body (24 millim.) and entirely testaceous red. *Thorax* somewhat slender and testaceous, with three broad and narrowly separated mesonotal vittæ, post-tegular dots, mesosternum, whole prothorax (except its disc), a broad central metanotal fascia, and spots above the hind coxæ, black; mesonotum somewhat dull and pilose; metanotum dull and rugulose throughout, with the central and prebasal transverse carinæ strong, its apical half irregularly and somewhat deeply striate, with two short parallel discal carinæ in the centre of its base; all the pleuræ distinctly strigose and the mesosternum finely punctate; spiracles transverse, linear. *Scutellum* scabrous and testaceous, with strong and subparallel lateral carinæ to near its apex; post-

Fig. 109.—*Henicospilus hariolus*, Morl.

scutellum laterally carinate. *Abdomen* very slender and testaceous, with apical half of the three basal, and nearly the whole of the remaining, segments determinate black; basal segment glabrous, very strongly nitidulous, with its apex nodulose; the second broadly and not strongly constricted towards the base, its apex and the remaining segments distinctly pilose. *Legs* testaceous, with the hind coxæ, and more or less of their femora black; claws minute and distinctly, not densely, pectinate. *Wings* hyaline, with nervures and costa of both pairs of wings blackish; tegulæ, stigma and metacarpus testaceous; radius basally straight and thickened; glabrous area of first cubital cell well-defined, with a larger subtriangular red corneous mark, which is obtuse above, below the basal third of the first radial abscissa, and a second small mark below its apical third; second recurrent longer than the submarginal nervure; internal cubital subsinuate but not strongly curved, with no nervelet; basal nervure continuous through the median; nervellus distinctly postfurcal, intercepted at its lower fourth with the upper part subvertical.

Length 15–22 millim.

CEYLON: Kandy, 2000 ft., v. vi. viii. and ix. (*E. E. Green, Col. J. W. Yerbury, O. S. Wickwar, T. B. Fletcher*), Madulsima, v. 08 (*Fletcher*).

Type in the author's collection.

The coloration is somewhat variable since I find the stigma sometimes infuscate, the metathorax and second segment and hind coxæ often immaculate testaceous, the hind femora rarely no more than centrally brunneous, sometimes entirely black with their base alone pale, the basal segment with only the postpetiole infuscate and even that apically testaceous; the third segment, however, appears to be invariably infuscate laterally at its apex, rendering the large pale lateral spot at the base of the fourth very conspicuous.

This species should probably be referred to a new genus (hence my specific name); but although the facies is distinct from *Henicospilus*, I can find no characters of probable generic value except the distinctly, not densely, pectinate tarsal claws.

It is evidently an abundant species, though not yet known to occur outside Ceylon, where many specimens were taken by Thwaites in 1873.

284. Henicospilus reticulatus, *Cam.*

Enicospilus reticulatus, Cameron (*nec* Cameron, 1899), Fauna Maldive et Laccadive Arch. I, i, 1902, p. 51 (♀).

♂ ♀. A luteous species. *Head* with the face centrally shagreened, laterally flavescent and punctate; clypeus flavescent and glabrous, with indistinct basal punctation; labrum darker, mandibular teeth black; orbits and vertex flavescent. *Antennæ* luteous, becoming apically darker. *Mesonotum* infumate, with the base and sides paler; metanotum irregularly and distinctly

reticulate, its apex obliquely reticulate, but less distinctly in the centre below, its base glabrous; pro- and meso-pleuræ closely punctate, with the former centrally, and the latter below, closely striate; metapleuræ shagreened above and sparsely striate apically below. *Scutellum* with stout carinæ; its apex closely and longitudinally striate. *Abdomen* apically black. *Legs* concolorous with the body; hind tarsi slightly but distinctly longer than the tibiæ, and the anterior twice their length. *Wings* clear hyaline, with the stigma and nervures infuscate; first cubital cell with two corneous marks, the basal dilated and rounded behind, with its upper part somewhat triangular, the apical suboval; basal nervure not continuous through the median.

Length 14 millim.

MALDIVE ISLANDS: Hulule, Male Atoll, i. or ii. 1900 (*Prof. Stanley Gardiner*, type); PUNJAB: Kangra Valley, 4500 ft., x. 99 (*G. C. Dudgeon*); BURMA: Karen Hills, 3000–3700 ft., vi. 88, and Bhamo, vii. 86 (*L. Fea*). MALAY STATES: Penang (*H. N. Ridley*), Selangor, ii. 08 (*G. Meade-Waldo*); DINDING ISLANDS; SARAWAK; CELEBES; CERAM.

This species must not be confused with the same author's earlier one under the same name; but since I have placed that in a distinct genus, the present name may be allowed to stand.

285. **Henicospilus merdarius**, *Grav.*

Ophion merdarius, Gravenhorst, Ichn. Eur. iii, 1829, p. 698; Curtis, Brit. Ent. xiii, 1836, no. 600; Ratzeburg, Ichn. d. Forst. i, p. 101; Holmgren, Sv. Ak. Handl. 1858, pt. 8, p. 11; Vollenhoven, Pinac. pl. vi, p. 44 (♂ ♀).

Enicospilus merdarius, Thomson, Opusc. Ent. xii, 1888, p. 1188; Brauns, Arch. Nat. Mecklenb. 1889, p. 96 (♂ ♀).

Eniscospilus xanthocephalus, Cameron, Spolia Zeylanica, 1905, p. 122 (♀).

Henicospilus merdarius, Bridgman & Fitch, Entomologist, 1884, p. 177 (♂ ♀).

♂ ♀. A testaceous, glabrous and nitidulous species, with sparse flavous and black markings. *Head* pale flavous, with the ocellar region black, the occiput and a central facial line red; clypeus apically broadly rounded. *Antennæ* testaceous red. *Thorax* with the basal slope of metanotum with a carina in the centre and one on the sides; the basal region smooth, the apical almost smooth in the centre, the sides transversely striated; mesopleuræ finely punctate above, finely and longitudinally striate below. *Scutellum* pale flavous. *Abdomen* testaceous, with the basal two-thirds of the first segment flavous, and the anus black from the fifth segment. *Legs* immaculate. *Wings* clear hyaline, with the stigma clear testaceous, the costa and nervures black; glabrous area with two corneous marks, the basal and larger broadly rounded above, slightly and gradually constricted to its transverse apex, the apical and much smaller mark about thrice as long as broad, basally oblique and apically constricted; transverse cubital

nervure straight, oblique and rather more than half the length of the recurrent, which is about a fourth shorter than the apical abscissa of the disco-cubital nervure; third discoidal cell short and broad, its length hardly exceeding double its apical breadth; basal nervure continuous through the median.

Length 11–20 millim.

PUNJAB: Kangra Valley (*G. C. Dudgeon*); UNITED PROVINCES: Dehra Dun (*A. D. Imms*), Agra, 360 ft., and Lucknow, 950 ft. (*E. Brunetti*—Ind. Mus.), Rampur Chaka and Meerut (Ind. Mus.); SIKKIM (Ind. Mus.); ASSAM: Sibsagar (*S. E. Peal*); BENGAL: Chapra and Pusa (Pusa coll.), Calcutta and Bettiah (Ind. Mus.); CENTRAL PROVINCES: Balaghat, Nagpur, Hoshangabad and Powarkheda (Pusa coll.); RAJPUTANA: Mt. Abu (*Col. Nurse*); BOMBAY: Igatpuri and Nadiad (Pusa coll.); MADRAS: Anantapur and Saidapet (Pusa coll.), Ganjam, Bangalore and Maddathorai (Ind. Mus.); CEYLON: Paradeniya (*E. E. Green*), Diyatalawa, 4000 ft., and Pattipola, 6000 ft. (*T. B. Fletcher*), Colombo and Madulsima (*O. S. Wickwar*); TENASSERIM (*W. Doherty*—Ind. Mus.). MALAY STATES: Penang. EUROPE.

Type in the Breslau Museum.

At once distinguished from the other species of this genus, described by Cameron in 1905, by the comparatively short and broad third discoidal cell.

This species is very abundant throughout nearly the whole of Europe, but has not hitherto been known to extend further East. It has often been bred from a large number of Noctuid moth caterpillars. No doubt can remain, I think, that Cameron's description of his *H. xanthocephalus* applies to Gravenhorst's species; most of the Indian specimens I have examined have the head testaceous. It is certainly one of the commonest of the Indian species of this genus. In the Pusa collection there is a specimen bred from the Lymantriid moth, *Euproctis scintillans*, Wlk., and Mr. Green has bred a small male from the larva of *Euproctis fraterna*, Moore, at Peradeniya.

286. **Henicospilus melanocarpus**, *Cam.*

Eniscospilus melanocarpus, Cameron, Spolia Zeylanica, 1905, p. 122 (♀).

♀. A rufescent species, with only the antennæ and anus black. *Head* immaculate. *Antennæ* black, broadly rufescent basally. *Thorax* with the metanotum closely reticulate, but becoming less so at the smooth base, where it is irregularly and longitudinally striate, with the basal impression closely and strongly striate, more closely centrally than laterally; pleuræ closely but not strongly punctate, metapleuræ more strongly, propleuræ centrally closely striate. *Scutellum* with lateral, abnormally stout carinæ. *Abdomen* rufescent, with the anus from the fifth segment black. *Legs* immaculate. *Wings* hyaline

with the stigma and nervures black; the glabrous area with two corneous marks, the larger triangular, laterally rounded, with a long curved tail, the smaller about twice as long as broad, rounded behind, with the apex transverse; submarginal nervure one-third the length of the apical abscissa of the internal cubital nervure and about a fourth shorter than the recurrent.

Length 12 millim.

BOMBAY: Igatpuri, vii. 04 (Pusa coll.); CEYLON: Kandy, iii. 03, iv. 05, vi. 09 (*E. E. Green*, type; *Rowland Turner*), Galle, vi. 07 (*T. B. Fletcher*).

The specimen from Igatpuri differs from the above description only in having the central mesonotal lobe apically blackish.

287. **Henicospilus atricornis**, *Morl.*

Henicospilus atricornis, Morley, Revis. Ichn. Brit. Mus. 1912, p. 46 (♂ ♀).

♂ ♀. A testaceous and slender species, with the ocellar region, antennæ, anus and stigma black, and the mesonotum centrally infuscate anteriorly. *Head* without flavous markings, very strongly constricted behind the eyes. *Antennæ* entirely black and elongate. *Thorax* unicolorous testaceous, with only the central mesonotal lobe apically infuscate; petiolar area finely and subgranulately trans-aciculate throughout, and not impressed. *Scutellum* almost glabrous and distinctly carinate laterally to its extreme apex, where the carinæ coalesce. *Abdomen* abruptly deep black from apex of fourth segment. *Legs* with tarsal claws densely pectinate to near their apices. *Wings* with the costa and stigma entirely black; first cubital cell with but a single triangular ferruginous corneous mark, produced apically below; nervulus antefurcal.

Length 16-17 millim.

BENGAL: Chapra (*Mackenzie*, type—Pusa coll.); CENTRAL PROVINCES: Nagpur and Chikla, Balaghat (Pusa coll.); CEYLON: Namunakule, 6600 ft., ii. 10 (*E. E. Green*).

Type in the Pusa collection.

This species has the facies of *H. repentinus*, Holmg., but the petiolar area is trans-aciculate, the head extremely narrow posteriorly, the radius is much more curved and the apex of the first cubital cell is also appreciably more sinuate; the stigma, costa, anus, antennæ, and ocellar region are black. It also bears some close affinity to *H. melanocarpus*, Cam., but is at once recognised from that species by its larger size and by the possession of but a single corneous alar mark; further, the submarginal nervure is fully half the length of the apical abscissa of the internal cubital nervure and about as long as the recurrent nervure.

In the Pusa collection there are some females bred from the Pyralid moth, *Sylepta derogata*, F.

Var. **zeylanicus**, nov.

Differs only in the possession of a second minute corneous circular mark beneath the centre of the basal abscissa of the radius.

Ceylon: Kandy and Peradeniya, v. vi. and vii. 09 (*E. E. Green*), Maskeliya, iii. 09 (*T. B. Fletcher*).

Type in the author's collection.

The variety *zeylanicus* is by far the commoner form that I have received from Mr. Green from Ceylon, where it would appear to be among the most abundant of Ichneumonidæ.

288. **Henicospilus spilonotus**, *Cam.*

Eniscospilus spilonotus, Cameron, Spolia Zeylanica, 1905, p. 121.

A rufescent-testaceous species, with black markings. *Head* flavous, with the ocellar region black. *Antennæ* black, becoming infuscate apically. *Thorax* with three broad black mesonotal lines; metanotum glabrous at its base and apex, its centre with roundly curved and irregular striæ, and the base of the apical part also glabrous, with a few irregular striæ; spiracular areæ coarsely irregularly and obliquely striate, more strongly so apically; propleuræ subglabrous, mesopleuræ centrally finely and closely striate except above; metapleuræ finely and irregularly striate below the carinæ; metasternal carina stout, and curved both at the apex and at the dilated base. *Scutellum* flavous, with its apical half irregularly striate. *Abdomen* rufo-testaceous, with the anus from the fifth segment black. *Wings* hyaline, with stigma and nervures black; the glabrous area with a single corneous mark, broadly transverse below and roundly constricted in front, basally round and apically slightly rounded inwardly; submarginal nervure two-thirds the length of the recurrent, which is more than double its length from it.

Length ?

Ceylon (*E. E. Green*).

Cameron has entirely omitted to indicate the locality, sex and length of this species, which he notes as being distinct from the Javanese *Ophion plicatus*, Brullé (Hist. Nat. Ins. Hym. iv, p. 145), though it possesses a similarly black-marked mesonotum. I am unacquainted with the species.

289. **Henicospilus striatus**, *Cam.*

Enicospilus striatus, Cameron, Manch. Mem. 1899, p. 103 (? ♂).

♂ ♀. A flavous species, with the metanotum striate. *Head* with the face closely punctate, impressed above, with the epistoma tuberculiform, nitidulous and blackish; mandibles broadly black at

their apices. *Thorax* with the mesonotum subinfuscate, closely punctate and with short white pubescence; "the base of the [median] segment deeply and widely depressed, the depression stoutly longitudinally keeled in the middle; the apex in the middle broadly deeply triangularly depressed. This basal part is bordered by a stout transverse keel; in front of this the segment is irregularly longitudinally striated; the apical half stoutly striated, the striæ curved, almost semicircular;" propleuræ closely and obliquely striate; mesopleuræ closely punctate, with their apices broadly impressed below, and the base sinuately carinate on the lower half. *Scutellum* gradually and distinctly constricted apically, laterally carinate and basally closely punctate, with the apex rugose, subpunctate and trans-aciculate, "at the apex below there is a stout, curved keel, from the end of which on either side, a curved keel runs to a transverse one." *Abdomen* immaculate. *Legs* paler than the body, with the tibiæ and tarsi flavidous. *Wings* hyaline, with a single oblique, elongate and apically obtuse corneous spot in the glabrous area; stigma fulvous, nervures blackish; basal nervure not continuous through the median.

Length 16–24 millim.

Assam: Khasi Hills (*Rothney*, type); Bhutan, vii. 95 (*G. C. Dudgeon*). China; Singapore; Sarawak.

Type in the Oxford Museum.

This species is said by its author to be known from *H. reticulatus* by its smaller size, immaculate thorax and abdomen, the basal nervure not continuous, "by the scutellum not being distinctly narrowed towards the apex" (*cf. supra*), nor longitudinally aciculate, but more distinctly carinate laterally. It is allied to *H. ceylonicus*, but the metanotum is striate and not coarsely shagreened, and the glabrous alar area bears but a single corneous spot.

290. **Henicospilus orientalis**, sp. n.

♂ ♀. A large dull and pale testaceous species, with only a small black mark at the base of front wings behind the tegulæ. *Head* paler and stramineous, sulcate between the antennæ to a small carina above the face. *Antennæ* 25 millim in length. *Metanotum* dull and shagreened beyond the subobsolete transverse carina, with fine and indistinct trans-aciculations and the broad central sulcus not deeply impressed. *Wings* with the basal nervure not continuous through the median; first cubital cell strongly convex above; radius strongly sinuate basally, with a single linear corneous mark, higher at apex than base, beneath the centre of its basal abscissa.

Length 23 millim.

Central India (*Hearsey*); Bombay: Thana, near Poona, xii. 85 (*R. C. Wroughton*); Ceylon (*Thwaites*, type).

Type in the Oxford Museum.

The single linear corneous mark beneath the centre of the basally bisinuate basal radial abscissa is unique in my knowledge. This species is very like *Allocamptus undulatus*, Grav., but with the radius a little less strongly reflexed, the first discoidal cell narrower though geniculate at the same point above, and the metathorax is scabrously circumstriate, but much less strongly than in the latter species and *A. sinuatus*, Morl. It is also closely allied to *Henicospilus flavicaput*, though at once known by the single linear mark, the much more strongly sinuate base of the radius, strongly curved first cubital nervure and less strongly sculptured metathorax.

291. **Henicospilus dasychiræ**, *Cam.*

Eniscospilus dasychiræ, Cameron, Spolia Zeylanica, 1905, p. 123 (♀).

♀. A pale luteous species, with no black markings. *Head* pale flavous. *Antennæ* red. *Thorax* with the metanotum basally glabrous, the basal impression with a stout central and two or three lateral carinæ, "the base, behind the keel, is irregularly striated; the striæ in the centre longitudinal, the others irregularly transversely, the rest of the segment with close, rather strong, regularly roundly curved striæ;" propleuræ closely and obliquely striate, mesopleuræ closely punctate, metapleuræ closely, coarsely and obliquely striate. *Scutellum* laterally carinate throughout. *Abdomen* darker than pale luteous, especially towards its anus. *Legs* immaculate, densely pilose, but more sparsely on the tibiæ and tarsi. *Wings* hyaline, with the stigma, costa, and basal abscissa of the radius testaceous; glabrous area with a single small pyriform corneous mark; transverse cubital nervure slightly and roundly curved, as long as the recurrent: disco-cubital nervure centrally curved and incrassate, broadly fenestrate.

Length 21 millim.

CEYLON: Pundaluoya (*E. E. Green*).

The type was bred by Green from the Vapourer Moth, *Dasychira horsfieldi*, Saund., in January.* I consider it probable that this species is not distinct from the next; I have seen no specimens that I can ascribe to it.

292. **Henicospilus horsfieldi**, *Cam.*

Eniscospilus horsfieldi, Cameron, Spolia Zeylanica, 1905, p. 124 (♀).

♂ ♀. So similar to the last-described species that no detailed description is necessary; therefrom it differs in having the sub-

* "I may here add that on the 15th May an Ichneumonid insect escaped from the cocoon found on the tea bush" among larvæ of *Dasychira* (*Olene*) *mendosa*, Hübn., on the 21st April at Tiphook in Assam (Watt, Pests of Tea Plant, p. 234).

marginal nervure straight, oblique, not distinctly rounded, but distinctly shorter than the recurrent nervure, whereas in the last species it is distinctly rounded and as long as the recurrent nervure; the present is, too, three millimetres shorter than the last species. Cameron refers to the thorax thus:—"Base of metanotum shagreened; the base of the apical part has one or two longitudinal keels; the rest with irregular, curved keels pointing towards the apex; the rest is closely covered with roundly curved backwards striæ, which, at the apex, extend on to the pleuræ. Propleuræ rather strongly obliquely striated in the middle; the mesopleuræ in the centre above broadly, and below entirely striated; the upper part of the metapleuræ coarsely, irregularly reticulated; the rest closely, somewhat strongly, obliquely striated."

Fig. 110.
Henicospilus horsfieldi, Cam.

Length 15–18 millim.

UNITED PROVINCES (*Mrs. Horne*); ASSAM (*Badgley*); BENGAL: Pusa and Chapra (Pusa coll.); BOMBAY: Bandra (*Dr. Jayakar*); DECCAN (*Col. Godwin-Austen*); MADRAS: Nilgiri Hills (Oxford Mus.), Bangalore (Ind. Mus.); CEYLON: Peradeniya (*E. E. Green*, type).

Var. **glabratus**, nov.

There is a form of this species with the corneous alar marks entirely wanting, and the face more closely sculptured and with longer pubescence than in the type form, and the costa more conspicuously blackish. I cannot, however, bring myself to regard it as of specific rank in so unstable a genus as the present. That it belongs here is, I think, sufficiently shown by the conspicuously glabrous alar area. I have seen two specimens.

BENGAL: Chapra (*Mackenzie*).

Type in the Pusa collection.

293. **Henicospilus crassus**, *Morl.*

Henicospilus crassus, Morley, Revis. Ichn. Brit. Mus. 1912, p. 47 (♂).

♂. A peculiarly small and squat, flavous-marked testaceous species, with the head, legs, antennæ, thorax, and especially the metathorax, short and stout. *Head* posteriorly normal, not constricted, and entirely bright flavous, with only the mandibles darker; face nitidulous and obsoletely punctate, with an inconspicuous tubercle below the testaceous and unusually stout

antennæ, which are shorter than the body (length 10 millim.). *Thorax* short, stout, dull, and punctate; testaceous, with four anteriorly coalescent stripes on the mesonotum, most of prothorax, mesopleuræ apically and below and broadly at the base, and the metathorax (except on either side of its base above), bright flavous; metanotum very short and irregularly punctate, with no trace of transverse carinæ, but its apex irregularly trans-aciculate and with a short central longitudinal carina; pleuræ closely punctate, with no striæ. *Scutellum* flavous, nitidulous, deeply and isolatedly punctate, with its sides carinate to apex. *Abdomen* hardly double the length of the head and thorax, unicolorous testaceous, not very slender, with the basal segment apically subincrassate. *Legs* distinctly short and somewhat stout, with the outer intermediate calcar subobsolete. *Wings* hyaline and not ample, with the apex of the front ones unusually acute; tegulæ and the narrow stigma testaceous; costa of both wings and the metacarpus blackish; radius straight and very little thickened basally, with a single triangular flavescent corneous mark below its extreme base; submarginal and second recurrent nervures of equal length; basal nervure subcontinuous through the median.

Fig. 111.—*Henicospilus crassus*, Morl.

Length 13 millim.

"INDIA" (*Capt. Boys*).

Type in the Oxford Museum.

This species agrees with Szépligeti's description of *H. variegatus* (Ann. Mus. Hungr. 1905, p. 519) from Turkestan, except in the conformation of the head, which, though not broad, cannot be said to be obliquely constricted posteriorly; and he would certainly have called attention to the peculiarly squat thorax, which is quite distinct from that of any species of this genus with which I am acquainted. The subobsolete external intermediate calcaria, with the short rugose metathorax, show traces of affinity with *Nototrachys*.

Tribe *NOTOTRACHIDES.*

Genus **NOTOTRACHYS**, *Marsh.*

Nototrachys, Marshall, Trans. Ent. Soc. Lond. 1872, p. 260.
Trachynotus, Gravenhorst (*nec* Latr.), Ichn. Eur. iii, 1829, p. 713.

GENOTYPE, *Ophion foliator*, F.

Head posteriorly dilated; clypeus more or less discrete basally, apically subimpressed on either side and bituberculate; mandibles with teeth of unequal length; eyes oval and internally subemarginate. Antennæ slender and shorter than the body. Thorax scabrous, with the metathorax rugose; spiracles minute and oblong. Scutellum laterally carinate throughout. Abdomen slender, petiolate and compressed, with the two basal segments of equal length, spiracles of the first beyond its centre, and the third segment shorter; terebra exserted, with the valvulæ apically clavate. Tibiæ somewhat stout, with the anterior unicalcarate; claws only sparsely pectinate basally. Wings short, with no areolet; second recurrent emitted from the evenly curved first cubital cell.

Range. World-wide.

The generic characters may be regarded as representing those of the tribe, since but one genus is at present known from India, though *Eugnomus*, Först. (Verh. pr. Rheinl. 1868, p. 147), differing in its basally areated metanotum and the second recurrent being emitted beyond the submarginal nervure, has been recorded by Tschek (Verh. z.-b. Ges. 1871, p. 67) from Asia Minor.

Ten American and three European species of this genus have been described. It differs from all species of OPHIONIDES in its very short antennæ and scabrously rugulose mesonotum. Bridgman and Fitch very correctly regard this (Entom. 1884, p. 180) as a group of transition between the OPHIONIDES and the ANOMALIDES, with tendencies to a closer connection with the latter tribe, to which it was first relegated by Holmgren (Öfv. 1858, p. 322). I have recently shown (Revis. Ichn. Brit. Mus. 1912) that it can hardly be regarded as distinct from the former, since transitional forms occur in the Neotropical Region.

Table of Species.

1 (2) Metanotum and mesopleuræ dull and scabro-reticulate	*foliator*, Fab.
2 (1) Metanotum and mesopleuræ with interstices glabrous	*variistriatus*, Morl.

294. **Nototrachys foliator**, *F.*

Ophion foliator, Fabricius, Ent. Syst., Suppl. 1798, p. 239; Blanchard, Hist. Nat. Ins. iii, p. 326.
Bassus foliator, Fabricius, Syst. Piez. 1804, p. 100; Gravenhorst, Germ. Mag. Ent. 1821, p. 271 (♂ ♀).

Ichneumon foliator, Thunberg, Mém. Ac. Sc. Pétersb. 1822, p. 274; id., *op. cit.* 1824, p. 347.

Trachynotus foliator, Gravenhorst, Ichn. Eur, iii, 1829, p. 715; Holmgren, Sv. Ak. Handl. 1858, p. 13; Taschenberg, Hym. Deut. 1866, p. 70 (♂ ♀).

Nototrachys foliator, Bridgman & Fitch, Entom. 1884, p. 180 (♂ ♀).

♂ ♀. A rufescent or black, very dull and rugose species, with the head and thorax nearly always more or less red. *Head* with the frons and vertex somewhat nitidulous, the former finely trans-aciculate and centrally very distinctly carinate; face and clypeus closely and distinctly punctate, mandibles red. *Antennæ* slender, extending to apex of basal segment, blackish throughout, 22-jointed; scape testaceous or black. *Thorax* with the mesonotum irregularly and not very strongly rugulose, more finely laterally; metanotum and mesopleuræ scabrous and reticulate throughout, not smooth between the reticulations, and the latter not at all striate above; areola small, hexagonal and indistinct; basal carina strong. *Scutellum* rugulose and laterally stoutly carinate. *Abdomen* glabrous and nitidulous, with the basal shorter than the second segment and apically incrassate; terebra as long as the second segment. *Legs* entirely testaceous, with the hind tibiæ, except their invariably white base, darker or black, with the anterior legs paler; hind tibiæ longer than their tarsi, with the calcaria normal and of equal length. *Wings* hyaline, with the apices subinfumate, nervures and stigma black; basal nervure continuous through median; internal cubital nervure roundly curved; nervellus not intercepted.

Fig. 112.
Nototrachys foliator, F.

Length 10–14 millim.

PUNJAB: Kangra Valley, 4500 ft., iv. 99 (*G. C. Dudgeon*); BENGAL: Chapra, iii. 06 (*Mackenzie*), Pusa, vii. 06 (Pusa coll.), Calcutta, Bettiah and Katihar (Ind. Mus.); CENTRAL PROVINCES: Hoshangabad (Pusa coll.); BOMBAY: Poona, ix. 86 (*R. C. Wroughton*); CEYLON: Colombo, v. 04 (*O. S. Wickwar*); BURMA: Moulmein (*N. Annandale*). EUROPE; NORTH AFRICA.

Very variable in colour; specimens I possess from Ajaccio, taken by the Rev. T. A. Marshall, are black, with the head and thorax only sparsely marked with red; but most of the Indian examples I have seen are bright testaceous with only the abdomen infuscate, while one male has the whole scutellum and most of the black-marked thorax clear flavous, though no structural distinctions are traceable. Wroughton took an almost entirely

black male at Poona; and Dudgeon a flavous and black ♂, with testaceous ♀ ♀, in the Kangra Valley.

This is known to be a widely distributed species throughout Europe, from Sweden to northern Africa, though rarer further north and very doubtfully British, since the only record of which I am aware is by Ingpen in 1839 (in his "Instructions," p. 62). Dr. Giraud tells us that Perris once bred this species from the heteromerous beetle, *Hymenorus doublieri*, Muls.

[I here transcribe the descriptions of two species, thought by their author to be new, which appear to be nothing but representatives of the innumerable colour varieties of the above protean species:—

Nototrachus rufo-orbitalis, Cameron, Journ. Bombay Nat. Hist. Soc. 1906, p. 276 (♀).

"Black; the eye orbits narrowly below, more broadly above, dark rufous; behind extending on to the ocelli; and on it, opposite the ocelli, is a yellowish mark. The fore legs are fuscous tinged with yellow; the four hinder black, their knees yellow; the hind tibiæ are fuscous on the inner side. Wings hyaline, the stigma and nervures blackish.

"Face and clypeus shining, sparsely punctured; the front keeled down the middle, stoutly, irregularly obliquely striated; the sides sparsely punctured; the vertex is smooth and shining. Pronotum irregularly, transversely striated. Mesonotum stoutly, irregularly reticulated; the middle lobe is broadly bordered by dark rufous. Scutellum transversely striated, almost reticulated; the apical half is dark rufous; the sides are stoutly keeled, the keels meeting in the middle. Metanotum stoutly reticulated; there is a smooth area, longer than wide, in the centre of the base. Pro- and meso-pleuræ, except the upper half of the latter at the apex, closely, stoutly, longitudinally striated, the striæ running into each other; the metapleuræ stoutly longitudinally striated-reticulated. The upper part of the propleuræ is broadly rufous. Abdomen smooth, bare, and shining. Length 7 millim.; terebra 2 millim."

BALUCHISTAN: Quetta, v. 02 (*Col. Nurse*).

Type in Col. Nurse's collection.

The type is a very small insect, differing from *N. foliator* only in having the upper basal nervure slightly less curved immediately above the median, and the median of the hind wing not at all curved above the nervellus. Probably it is no more than a small local race.

Nototrachus flavo-orbitalis, Cameron, Journ. Bombay Nat. Hist. Soc. 1907, p. 591 (♂).

"Head and thorax rufous, the face, except in the centre above, the orbits broadly all round, a line on the sides of mesonotum, dilated roundly, inwardly at the base, scutellum, except the basal slope and more narrowly at the apex, a line on the lower part of

propleuræ, dilated at the apex, a small, triangular mark below the tegulæ, a larger one in the middle below, a still larger, triangular mark below the hind wings and the apical half of metanotum, the spot narrowly dilated in the middle above, yellow; the ocellar region and the front broadly—the mark broadest above—a mark on the base of propleuræ in the middle, the scutellar depression and keels, the lower sides broadly, a spot covering the spiracles on metanotum and the abdomen, except the basal half of 1st segment (which is dull red), black. Four front legs rufo-fulvous, the coxæ yellow; the hind legs black, the coxæ rufous, the femora largely rufous. Wings hyaline, iridescent, not much longer than the head and thorax united; the stigma and nervures black. Antennæ black, the scape rufous below.

"Face closely, the clypeus sparsely punctured; the latter broadly black above, narrowed below to a point which is bidentate; the black central part of front strongly transversely striated and keeled down the middle, the sides punctured. Vertex sparsely punctured laterally and between the ocelli. Mesonotum reticulated, the base in the centre finely, minutely punctured, the sides transversely striated; the outer edges with large, clearly separated punctures. Scutellum coarsely punctured; the lateral keels black, distinct. Base of metanotum bordered by a transverse keel, smooth, with two keels in the middle; the rest reticulated and thickly covered with longish white pubescence. Propleuræ smooth at the base, the apex above punctured, the rest stoutly, longitudinally striated. Mesopleuræ rugosely punctured; more or less reticulated, the top stoutly striated at the base, smooth at the apex; the apex with stout striæ. Metapleuræ reticulated. Abdomen at least three times longer than the thorax, very smooth and shining. Length 9 millim."

BOMBAY: Deesa, ii. 99 (*Col. Nurse*).

Type in Col. Nurse's collection.

This male is identical with the one in the Pusa collection, referred to above, and with another in the Oxford Museum, simply labelled "India"; but I can trace no structural distinctions.]

295. **Nototrachys variistriatus**, *Morl.*

Nototrachys reticulatus, Cameron (*nec* Cresson), Spolia Zeylanica, 1905, p. 128 (♀).

Nototrachys variistriatus, Morley, Revis. Ichn. Brit. Mus. 1912, p. 70 (♀).

♀. A black species, with the legs dull testaceous in part. *Head* with the frons and vertex nitidulous, the former finely trans-aciculate and centrally longitudinally carinate; face obsoletely, and clypeus closely, punctate; mandibles red. *Antennæ* slender, extending to apex of basal segment, densely pubescent and black, sometimes becoming testaceous apically, twenty-jointed, with the apical as long as the two penultimate united; scape bright

testaceous, and the basal flagellar joint distinctly longer than the second. *Thorax* with mesonotum strongly and irregularly rugose, closely and strongly punctate laterally; metanotum smooth, with a network of very strong carinæ, more distinct on the basal than on the apical slope; the base bordered by a keel and with a small area, longer than broad and of equal width in the centre; propleuræ glabrous and apically stoutly striate; mesopleuræ smooth with rugulose carinæ and above strongly, subobliquely striate; metapleuræ rugulose and irregularly reticulate. *Scutellum* more broadly and irregularly reticulate than mesonotum, and laterally stoutly carinate; its basal fovea large, broad and deeply impressed. *Abdomen* glabrous and nitidulous, with the two basal segments as long as the head and thorax, the first shorter than second and apically dilated; terebra as long as second segment. *Legs*: anterior pair infuscate testaceous; the hind ones black, with their tarsi longer than the tibiæ, slender and very finely spinulose, their claws minute; calcaria normal and of equal length. *Wings* hyaline, with their apices subinfumate, and the nervures and stigma black; basal nervure continuous through the median; internal cubital nervure roundly curved; third discoidal cell basally more than half its apical breadth; nervellus not intercepted.

Length 7–9 millim.

CEYLON: Peradeniya, vi., vii. and ix. 09, ii. 10 (*E. E. Green*).

In my copy of Cameron's paper, the name *reticulatus* is erased and "*varistriatus*" substituted in MS. Cameron owns to ignorance of the genus *Nototrachys*, but considers the present species to agree well with the description of authors. His position of it is so correct that at first I was puzzled to separate it from *N. foliator*, but the face is subglabrous, the metanotum and mesopleuræ strongly and regularly reticulate, with the interstices glabrous and nitidulous, and the latter are strongly and regularly strigose above, the tarsi are longer than the tibiæ, the orbits immaculate, and all red coloration is wanting.

Tribe *ANOMALIDES.*

This tribe is one of the most distinctive among the ICHNEUMONIDÆ, and few of its members can be mistaken for those of any other section. Exceptions occur, however, as in most of our artificial divisions; thus the NOTOTRACHIDES are very similar in their abdominal conformation and scabrous sculpture, though at once known by the unicalcarate intermediate tibiæ; my new genus *Metanomalon* is aberrant wherever placed, and connects the present tribe with the CAMPOPLEGIDES, by the possession of a more or less complete areolet; and Cameron here placed his genus *Tarytia*, though I am convinced of its Cremastid affinities upon examining the types. Little difficulty should, however, be experienced in recognising the ANOMALIDES if account be taken of

the slender facies, stout head, coarse thoracic sculpture, slender antennæ, and narrow wings, with the more salient features, such as the distinctly broadened hind tarsi, apically produced metathorax and the entire lack of all trace of an areolet, which is emphasised by the external cubital nervure extending straight from the second recurrent nervure to the apex of the wing.

Compared with the present condition of the other tribes, we may consider this group, as it now stands, as fairly representative, probably on account of the large size and conspicuous coloration of the majority of its species, though doubtless the following is but a tithe of those that remain to be discovered.

Table of Genera.

1	(18)	Areolet entirely wanting; mesonotum sculptured.	
2	(17)	Eyes glabrous; scutellum not apically emarginate.	
3	(4)	Apex of clypeus broadly reflexed and bilobed	SCHIZOLOMA, Wesm., [p. 403.
4	(3)	Apex of clypeus neither reflexed nor bilobed.	
5	(6)	First hind tarsal joint nearly four times the length of second	HETEROPELMA, Wesm., [p. 405.
6	(5)	First hind tarsal joint hardly longer than double the second.	
7	(14)	Nervellus distinctly intercepted and geniculate.	
8	(9)	First recurrent emitted near centre of first cubital cell	EXOCHILUM, Wesm., p. 408.
9	(8)	First recurrent emitted very distinctly before centre.	
10	(13)	Second recurrent continuous with submarginal nervure.	
11	(12)	Head very strongly buccate; hind tarsi spatuliform	MAGNIBUCCA, Morl., [p. 414.
12	(11)	Head not strongly buccate; hind tarsi normal	BARYLYPA, Först., p. 415.
13	(10)	Second recurrent emitted beyond submarginal nervure	ANOMALON, Jur., p. 420.
14	(7)	Nervellus neither intercepted nor geniculate.	
15	(16)	Neuration of hind wings more or less complete	AGRYPON, Först., p. 424.
16	(15)	Neuration of hind wing entirely wanting apically	CLATHA, Cam., p. 427.
17	(2)	Eyes distinctly pilose; scutellum apically emarginate	TRICHOMMA, Wesm., [p. 428.
18	(1)	Areolet subcomplete; mesonotum entirely glabrous	METANOMALON, Morl., [p. 431.

Genus SCHIZOLOMA, *Wesm.*

Schizoloma, Wesmael, Bull. Ac. Brux. 1849, p. 120.

Genotype, *Ichneumon amictus*, F.

Head closely punctate and somewhat buccate posteriorly; frons with a central horn near base of antennæ; face not transverse, gradually and strongly constricted towards the mouth; clypeus hardly discrete, laterally foveate, with its apex bilobed and broadly reflexed; eyes large, glabrous and broader below; mandibular teeth very unequal in length, cheeks not excised. Antennæ somewhat shorter than the body. Thorax closely punctate; notauli feebly impressed; metathorax deeply impressed centrally at the apex. Scutellum black, and longitudinally sulcate centrally. Abdomen compressed, with the basal segment sublinear; terebra shortly exserted, with the valvulæ narrowly lanceolate. Legs slender; hind tarsi spatuliform, with the basal joint almost double the length of the second, their claws basally laminate and apically strongly inflexed; two basal joints of ♂ strongly dilated. Radius emitted before centre of stigma, basal nervure subcontinuous; nervellus postfurcal and intercepted above its centre; first recurrent nervure emitted from centre of first cubital cell; internal cubital subcontinuous with the median nervure.

Range. United States, Europe, India.

This genus is quite distinct in the straight lower side of the disco-cubital cell, which emits the first recurrent from its centre, and in the reflexed clypeus.

Table of Species.

1 (2) Vertical orbits flavous; internal cubital emitted lower	*fulvicornis*, Cam.
2 (1) Vertical orbits immaculate; internal cubital emitted higher	*amicta*, F.

296. Schizoloma fulvicornis, *Cam.*

Schizoloma fulvicorne, Cameron, Manch. Mem. 1899, p. 104 (♂ ♀).

Head black, with the face, the strongly punctate clypeus (except basally), frontal orbits (more broadly below and subinterrupted from vertical orbits), external orbits shortly, and mandibles (except at their apices), flavous; temples strongly, and vertex more strongly, punctate. *Antennæ* fulvous, becoming flavidous apically; scape flavous, with dense long pale hairs. *Thorax* immaculate, with dense fulvescent pubescence; pro- and mesothorax closely and strongly punctate; metathorax strongly reticulate, "at the base the areæ are longer than broad, in the middle broader than long; in the middle at the apex the keels form a large area rounded and narrowed at the base, and having inside of it three stout, slightly curved keels;" propleuræ centrally

striolate behind; mesopleuræ basally striate and irregularly reticulate, with their apical impression crenulate; metapleuræ strongly and irregularly reticulate, broadly impressed basally above. *Scutellum* with dense long dark hairs; its base hardly more strongly punctate than the mesonotum, its sides longitudinally striolate throughout, and the apex centrally rugose. *Abdomen* ferruginous, with the two basal segments discally black. *Legs*: anterior pairs flavous, with the femora subfulvescent; hind coxæ black, apically rufescent and (in ♂) flavous centrally beneath; their trochanters bright red, the femora and the basal two-thirds of the tibiæ dark red; apices of hind tibiæ black; hind tarsi fulvescent flavous and densely pilose, with the second joint flattened internally and in ♂ dilated apically. *Wings* fulvescent hyaline, with the stigma fulvous and the nervures darker; internal cubital nervure emitted from the upper third of the submarginal.

Length 25–33 millim.

United Provinces: Mussoori, 7500 ft., viii. 06 (*H. M. Lefroy* —Pusa coll.); Assam: Khasi Hills (*Rothney*, type)

Type in the Oxford Museum.

297. **Schizoloma amicta**, *F.*

Ichneumon amictus, Fabricius, Syst. Ent. 1775, p. 341; id., Syst. Ins. 1781, p. 436; id., Mant. Ins. i, p. 269; Villers, Linn. Ent. iii, 1789, p. 200; Gmelin, Linn. Syst. Nat. 1. v, 1790, p. 2710; Rossi, Mant. 1792, p. 123; Fabricius, Ent. Syst. ii, 1793, p. 181.
Ophion amictus, Fabricius, Ent. Syst., Suppl. 1798, p. 237; id., Syst. Piez. 1804, p. 133; Olivier, Encycl. Méth. viii, 1811, p. 511.
Anomalon amictum, Gravenhorst, Ichn. Eur. iii, 1829, p. 650; Ratzeburg, Ichn. d. Forst. i, p. 88; ii, p. 77; Vollenhoven, Pinac. pl. iii, fig. 5 (♂ ♀).
Therion amictum, Curtis, Brit. Ent. xvi, pl. 736 (♂).
Schizoloma amictum, Wesmael, Bull. Ac. Brux. 1849, p. 120; Holmgren, Sv. Ak. Handl. 1854, p. 24; id., *op. cit.* 1858, p. 13; Kirchner, Lotos, 1856, p. 234; Bridgman & Fitch, Entom. 1884, p. 181; Thomson, Opusc. Ent. xvi, 1892, p. 1757 (♂ ♀).

A large black species, with red abdomen and legs; at once known from the whole of the other Anomalides by its distinctly reflexed and bilobed clypeus.

Length 18–26 millim.

United Provinces: Mussoori, vii. 05 (*E. P. Stebbing*). Europe.

Type in the British Museum.

No detailed description of this species is requisite here, since Cameron's description of the preceding species will very well represent the present one in every way, with the sole exception of its flavous vertical orbits which, in my experience, are always black in Fabricius's insect. *S. amicta* is stouter and more densely pilose, with the thorax broader and the metathorax shorter, the hind coxæ and trochanters are less elongate and the head more buccate on the vertex, the notauli less deeply impressed, the

clypeus more strongly elevated, though not more distinctly bilobed, and the internal cubital nervure is emitted from the submarginal very much nearer the radial nervure, which is less curved at its base.

Fig. 113.—*Schizoloma amicta*, F.

I have also seen three males in Westwood's collection at Oxford, taken in "India" by Boys. This is a considerable extension of its known range, which was previously supposed to be confined to Europe, throughout which, however, it is sufficiently frequent; it is very common in Britain and the Oriental examples differ in no way from British specimens in my collection; it has frequently been bred from Bombycid moths and rarely from pupæ of Noctuids, to which I believe it to be specially attached, since I have frequently received specimens bred from *Aplecta nebulosa*, Tr.

Genus **HETEROPELMA**, *Wesm.*

Heteropelma, Wesmael, Bull. Ac. Brux. 1849, p. 120.

Genotype, *H. calcator*, Wesm.

Head somewhat constricted posteriorly, closely punctate and densely pubescent. Antennæ shorter than the body. Thorax closely punctate and somewhat densely pubescent; notauli distinct; metathorax reticulate rugose with no carinæ. Scutellum deplanate and longitudinally canaliculate. Legs slender with the hind ones elongate; hind metatarsus at least thrice as long as the second joint; claws geniculate and not pectinate; ♂ with the two basal joints of hind tarsi spatuliform. Brachial cell extending to centre of first cubital cell, with the brachial and discoidal cells of equal length; second recurrent emitted from external cubital beyond the submarginal nervure; lower basal nervure slightly postfurcal; nervellus intercepted at or above its centre.

Range. Europe, North and Central America, India, Burma, Formosa.

This is a genus of only some half-dozen species, of which the type alone occurs in Europe, the remainder being American. Geometrid and Noctuid moths have been instanced as its hosts. I have seen all our indigenous species.

The genus may be instantly recognised by the extraordinary length of the basal hind tarsal joint.

Table of Species.

1 (4) Frons scabrous; hind coxæ and base of abdomen red.	
2 (3) Scutellum entirely, and external orbits nearly entirely, black	*calcator*, Wesm., p. 406.
3 (2) Scutellum, and external orbits very broadly, flavous..................	*orbitalis*, Morl., p. 407.
4 (1) Frons reticulate; hind coxæ and abdomen black above	*fulvitarsis*, Cam., p. 407.

298. **Heteropelma calcator**, *Wesm.*

Anomalon xanthopus, Gravenhorst (*nec* Schr.), Ichn. Eur. iii, 1829, p. 652 (excl. ♂).
Heteropelma calcator, Wesmael, Bull. Ac. Brux. 1849, p. 120 (♀); Holmgren, Sv. Ak. Handl. 1858, p. 15; Bridgman & Fitch, Entom. 1884, p. 187 (♂ ♀); *cf.* Kirchner, Lotos, 1856, p. 234, pl. 11.
Anomalon (*Heteropelma*) *calcator*, Holmgren, Öfv. Sv. Ak. Förh. 1858, p. 322; Thomson. Opusc. Ent. xvi, 1892, p. 1758 (♂ ♀).
Heteropelma reticulatum, Cameron, Manch. Mem. 1899, p. 110 (? ♀).

♂ ♀. *Head* black, with the face, clypeus, mandibles (except their teeth), palpi, the external obscurely and the frontal orbits shortly, fulvescent flavous; frons finely rugose, vertex irregularly reticulate; frontal orbits distinctly carinate and with dense dark hairs; face with sparse long dark hairs; epistoma circularly prominent and strongly though irregularly trans-striate; clypeus less strongly punctate, centrally transverse and laterally oblique; mandibles basally punctate, with the teeth slightly unequal. *Antennæ* red. *Thorax* immaculate and with dense dark hairs; mesonotum closely, and in the centre rugosely, punctate, with its base coarsely trans-striate and the notauli distinct; metathorax coarsely and strongly reticulate, distinctly constricted apically; propleuræ coarsely and obliquely striate, basally glabrous and apically strongly aciculate above; mesopleuræ irregularly striate basally, becoming reticulate centrally, with their apices strongly crenulate; metapleuræ stoutly trans-carinate above and below; mesosternum finely punctate, with the interpectoral sulcus somewhat dilated apically and with five transverse carinæ. *Scutellum* coarsely trans-striate. *Abdomen* red, with the petiolar spiracles near apex of basal segment. *Legs*: anterior pairs fulvous, with the coxæ and trochanters flavous; hind ones red, with the apical fourth of their tibiæ black, the metatarsus more than four

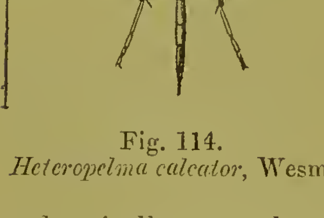

Fig. 114.
Heteropelma calcator, Wesm.

times the length of the second joint and double that of the four apical united; hind tarsi longer than their tibiæ, with simple claws. *Wings* fulvescent, with the stigma testaceous and the tegulæ red.

Length 20–22 millim.

SIKKIM (*Knyvett*—Ind. Mus.); ASSAM: Khasi Hills (*Rothney*—Oxf. Mus.), Margherita (Ind. Mus.). WESTERN EUROPE.

Type in the Brussels Museum.

From our other two species of this genus, the present is at once known by its scabrous and not reticulate frons and the almost immaculate external orbits of the eyes, which are so narrowly and obscurely flavous as to have escaped Cameron's notice.

I have seen two females, in the Calcutta Museum, agreeing perfectly in all other respects with Cameron's diagnosis of *H. reticulatum*, but with fulvescent wings. These are a little larger than the usual German form, which extends only to at most 20 millim., and are correspondingly more coarsely sculptured; but I can trace no specific distinction from examples captured by myself in the New Forest. I am not aware that its distribution has hitherto been known to extend into Eastern Europe.

299. **Heteropelma orbitalis**, *Morl.*

Heteropelma orbitalis, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 69.

♂. A red species, with the head and thorax black; the former with the mouth, face, frontal orbits shortly and external very broadly throughout, flavous; the latter with the scutellum, post-scutellum and tegulæ dull flavescent; second abdominal segment and the anus discally infuscate; legs immaculate; wings hyaline.

Length 18 millim.

BURMA: Karen Hills, 1300–2000 ft., xi. 88 (*L. Fea*).

Type in the Genoa Museum.

This species is so similar to the last as to need no detailed description; it agrees with it throughout in sculpture, though the coloration, and especially that of the wings, renders it abundantly distinct. Described from a single male.

300. **Heteropelma fulvitarsis**, *Cam.*

Heteropelma fulvitarse, Cameron, Manch. Mem. 1899, p. 111 (♀).

♂ ♀. *Head* black, with the face, clypeus, frontal orbits, and mandibles (except their teeth) flavous; clypeus and face coarsely and somewhat sparsely punctate, with sparse long white hairs; frons and vertex coarsely obliquely, and above closely, aciculate. *Antennæ* dark red, with the flagellum basally darker above. *Thorax* immaculate; mesonotum strongly punctate laterally and irregularly reticulate discally; metathorax strongly reticulate; propleuræ strongly striolate centrally, obliquely aciculate below and apically punctate above; mesopleuræ closely and finely punctate, with their apices centrally glabrous; mesosternum sparsely punctate with the interpectoral sulcus shallow, considerably dilated apically and with four transverse carinæ. *Abdomen* elongate and red, with

the two basal segments more or less discally black. *Legs* dark red, with the anterior flavidous in front; hind coxæ broadly above, the apical third of their tibiæ, and their onychii, black; hind tarsi spinose, with their basal joint fully four times the length of the second and double that of the remainder united. *Wings* infumate-hyaline; "the recurrent nervure is received shortly before the middle of the cellule; the transverse median shortly before the transverse basal;" stigma testaceous.

Fig. 115.—*Heteropelma fulvitarsis*, Cam.

Length 17 millim.

Assam: Khasi Hills (*Rothney*, type); Burma: Karen Hills, 3000–3700 ft. (*L. Fea*). Formosa.

Type in the Oxford Museum.

"A smaller and more slender species than *H. reticulatum*; may be known from it by the petiole and hinder coxæ being black above, by the front and vertex being distinctly reticulated, by the apex of the petiole not being abruptly narrowed into a point, but narrowed gradually, and by the much shallower mesosternal furrow." (Cameron, *l. c.*)

I have seen a male in the Genoa Museum which agrees so perfectly with the description of the female as to leave no doubt respecting their relationship. I cannot consider a male taken in Formosa by Wileman in 1908 as distinct, though the hind coxæ are immaculate red.

Genus **EXOCHILUM**, *Wesm.*

Exochilum, Wesmael, Bull. Ac. Brux. 1849, p. 121.

Genotype, *Ichneumon circumflexus*, L.

Head closely punctate; eyes glabrous, face transverse; frons with a small ridge or a horn behind the base of the antennæ; labrum distinctly exserted, clypeus apically roundly truncate, mandibular teeth of unequal length. Antennæ not elongate. Mesonotum closely punctate. Scutellum usually flavous. Terebra shortly exserted, with the valvulæ narrowly lanceolate. Hind tarsi with the basal joint about double the length of the second, and their claws slender; the second and third of ♂ strongly spatuliform. Second recurrent nervure emitted beyond the submarginal; basal nervure subcontinuous; first recurrent emitted from, and not before, centre of first cubital cell; nervellus rarely

strongly geniculate, but very distinctly intercepted nearly in its centre.

Range. World-wide.

The species of this genus are mainly from Northern America; but one or two occur in Africa and others are very common in Europe, though their range has hitherto been ascertained only as far east as Palestine. It is of interest to find them in the mountains of Assam.

Table of Species.

1 (2) Antennæ as long as thorax; scutellum bordered; clypeus produced	*barbaricum*, sp. n., p. 409.
2 (1) Antennæ longer; scutellum not bordered; clypeus simple.	
3 (8) Wings fulvescent-hyaline; metanotum reticulate.	
4 (7) Frons with a small ridge; scutellum not centrally impressed.	
5 (6) Head buccate; scutellum convex; external orbits hardly pale	*circumflexum*, L., p. 410.
6 (5) Head narrow; scutellum deplanate; external orbits flavous	*orbitale*, Morl., p. 411.
7 (4) Frons with a horn; scutellum longitudinally impressed	*acheron*, Morl., p. 412.
8 (3) Wings strongly blackish; metanotum rugose	*diabolus*, Morl., p. 413.

301. **Exochilum barbaricum**, sp. n.

♂ ♀. A stout species with very short antennæ and bordered scutellum. *Head* dull black and not posteriorly constricted, with the mouth and face flavous, the vertical and external orbits narrowly red; clypeus centrally produced into a subacuminate tooth; mandibles of equal length. *Antennæ* setaceous, black, with the scape basally pale beneath, of ♀ not and of ♂ hardly longer than thorax. *Thorax* black, coarsely punctate, with no notauli; metanotum with oval spiracles and no trace of areæ; extreme apical margin of mesopleuræ, and an apical spot on metapleuræ, red. *Scutellum* convex and not impressed, strongly punctate, red, with its sides black and stoutly carinate. *Abdomen* clear red, with the anus and extreme base

Fig. 116.
Exochilum barbaricum, Morl.

of first segment black; basal segment distinctly a little longer than the terebra, with subapical spiracles. *Legs* red, with the

anterior coxæ, at least above, and the hind ones entirely, black; hind trochanters basally, the whole of their femora, the apical third of their tibiæ and apices of the first and second tarsal joints, black; basal hind tarsal joint double the length of the following. *Wings* hyaline, with the first recurrent nervure emitted but slightly before the centre of the first cubital cell; intercubital nervure oblique and distinctly preceding the second recurrent; nervellus postfurcal, intercepted but hardly geniculate near its centre.

Length 15–18 millim.

TIBET: Gyangtse, 13,000 ft., vi. 04 (*H. J. Walton*).

Type in the British Museum.

The abbreviated antennæ, bordered scutellum and produced clypeus are so distinct as possibly to justify the erection of a new genus for this species.

I have drawn the above description from eleven specimens of both sexes.

302. **Exochilum circumflexum**, *L.*

Ichneumon circumflexus, Linnæus, Syst. Nat. ed. x, 1758, p. 566; Fabricius, Syst. Ent. 1775, p. 341; Rossi, Fauna Etrusc. ii, 1790, p. 52.

Ichneumon ramidulus, Christ, Naturg. Ins. 1791, p. 357, pl. xxxvii, fig. 2.

Ophion circumflexus, Fabricius, Syst. Piez. 1804, p. 133; Olivier, Encycl. Méth. viii, 1811, p. 511; Dumerc, Mém. Ac. Paris, 1860, p. 895.

Anomalon circumflexus, Jurine, Hym. p. 116; Lucas, Expl. Sc. Alg. iii, p. 327.

Anomalon circumflexum, Gravenhorst, Ichn. Eur. iii, 1829, p. 643; Brullé, Exped. Sc. Morée, ii, 1832, p. 380; Ratzeburg, Ichn. d. Forst. i, p. 87; ii, p. 77; Vollenhoven, Pinac. pl. iii, fig. 6 (♀)

Exochilum circumflexum, Wesmael, Bull. Sc. Brux. 1849, p. 122; Kirchner, Lotos, 1856, p. 234; Holmgren, Sv. Ak. Handl. 1858, p. 14; id., Öfv. 1858, p. 322; Bridgman & Fitch, Entom. 1884, p. 181; Thomson, Opusc. Ent. xvi, 1892, p. 1759 (♂ ♀).

Var. *Anomalon giganteum*, Gravenhorst, *op. cit.* p. 647; *cf.* Ratzeburg, Ichn. d. Forst. i, p. 87 (♂ ♀).

Anomalon mussouriense, Cameron, Manch. Mem. 1897, p. 26 (♀).

♂ ♀. *Head* with dense long fulvous hairs, black, with the internal orbits more broadly in front, face above, clypeus, labrum and mandibles (except at base and apex), fulvescent flavous; palpi red; frons and vertex coarsely and rugosely punctate; face and clypeus coarsely punctate and laterally depressed. *Antennæ* fulvous, with the two basal joints (comprising scape) entirely, and the third above, black. *Thorax* strongly punctate, with short dark pubescence, black, with the metapleuræ, and mesopleuræ apically, fulvous-marked and the apical mesopleural suture flavous; metanotum coarsely reticulate, centrally impressed, and the apex sinuately trans-carinate centrally. *Scutellum* flavous. *Abdomen*

fulvous, with the second, fifth and sixth segments discally black-lined, and the third to sixth laterally broadly black. *Legs* red, with the anterior paler and subflavidous; posterior coxæ except basally, and the apices of both the hind femora and tibiæ, black *Wings* unicolorous infumate-fulvous; stigma and costa fulvous; nervures infuscate.

Length 17–22 millim.

PUNJAB: Simla, 7000 ft., v. 07, x. 07 (*Col. Nurse, H. M. Lefroy*); UNITED PROVINCES: Mussoori (*Rothney*); ASSAM: Shillong, 6000 ft., iv. 03 (*Rowland Turner*). EUROPE.

The stout conformation, flavous scutellum, and conspicuously black apices of both the hind tibiæ and femora, render this handsome species easily recognised.

Ratzeburg has traced the life-history of this species from the egg in his 'Die Ichneumonen' (i, pp. 80–87; *cf.* pl. ix, figs. 11–22), and this may well be consulted as a typical account of the development of ICHNEUMONIDÆ.

There is a male in Col. Nurse's collection which Cameron had named *A. mussouriense.* This circumstance has enabled me to synonymise the latter's species with the Palæarctic variety *giganteum*, Grav., as brought forward by Ratzeburg and Wesmael. The typical form of *E. circumflexum* is common throughout Europe, but this variety, which averages larger and extends to 30 millim. in length, occurs principally in the south. It preys upon the larvæ of large Bombycid moths.

303. **Exochilum orbitale**, *Morl.*

Exochilum orbitale, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 78.

♂ ♀. A red species with the head and thorax, excepting the flavous mouth, face, frontal and very broad external orbits, tegulæ and scutellum, black; head not posteriorly buccate, antennæ slender and elongate.

Length 22 millim.

BURMA: Karen Hills, 3000–3700 ft. (*L. Fea*).

Type in the Genoa Museum.

This is too closely allied to the last species to need a detailed description; therefrom it differs in its more slender and elongate form, legs and antennæ, the posteriorly narrower head, with its conspicuous flavous external and vertical orbits, the entirely pale frontal cristula and scape, deplanate scutellum, and immaculate red hind femora and coxæ.

I associate the male with some degree of doubt; the sculpture and all essential points are analogous, but the external orbits are pale only below, and both the frontal cristula and scutellum are immaculate black; however, I greatly dislike erecting new species on unsatisfactory evidence, and the only male I have yet seen is a broken example from Shillong, Assam, 6000 ft., ix. 03 (*Rowland Turner*).

304. **Exochilum acheron**, *Morl.*

Exochilum acheron, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 79.

♂ ♀. A red species, with only the thorax and part of the head black. *Head* nearly as broad as the thorax and in ♀ not strongly buccate posteriorly; frons and vertex irregularly strigose, the former centrally carinate, with a somewhat elongate horn between the scrobes; face in both sexes flavous, largely and superficially punctate, somewhat shining; clypeus concolorous, apically truncate and subglabrous; cheeks wanting; mandibles (except apically), frontal orbits broadly above and below, the genal and centre of external orbits, flavous. *Antennæ* piceous (13 millim. in length), with their apical third clear fulvous; scape entirely flavous. *Thorax* black and rugosely punctate, with the mesopleuræ smoother and a pale callosity beneath radices; notauli indicated; metanotum with long black hairs, extremely strongly reticulate, with the interstices smooth, its produced apex trans-striate and laterally elevated. *Scutellum* (in the typical form) black, subquadrate, longitudinally strigose and centrally impressed. *Abdomen* red and discally linear, with the second and centre of first segment infuscate or black; basal segment slightly explanate laterally at its apical fifth and somewhat distinctly immediately before its apex; terebra 1 millim. in length. *Legs* red, with the anterior tibiæ and tarsi flavidous, and only the apical third of the hind tibiæ black; hind metatarsus fully double the length of the second joint and both spatuliform, with their tarsal claws strongly recurved and basally distinctly lobate. *Wings* slightly fulvescent, with the tegulæ and stigma fulvous; first recurrent emitted from centre of the internal cubital nervure; basal nervure subcontinuous; nervellus distinctly geniculate, postfurcal and intercepted above its centre.

Fig. 117.
Exochilum acheron, Morl.

Length 20–24 millim.

Type in the Oxford Museum.

This can hardly be the unknown ♀ of *E. signatum*, Grav., though certainly closely allied thereto as regards its elongate pilosity. The type is an old specimen and quite possibly rubbed, but the abdomen is by no means unusually short.

There is a pair of this species in the Calcutta Museum, which differs from the above description only in the flavous scutellum; I propose to term this, var. **scutellatum**. The pair in question was captured at Sadiya in Assam, whence the typical form also originates.

I have seen two females of this species at Oxford, in Westwood's collection, captured in "India" by Boys; and in the British Museum is a nice series, taken in "India" by Baly in 1851 and "Northern India" by Captain Reid in 1855. Its range is probably wide, since Fortune took it at Shanghai in 1854 and Bowring at Hong-Kong in 1861.

305. **Exochilum diabolus**, *Morl.*

Exochilum diabolus, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 73.

♀. A very large, dull black, pilose species, with nitidulous abdomen and blackish wings. *Head* nearly as broad as the thorax and not very buccate behind the internally broadly emarginate eyes; frons and vertex rugulose, with the former centrally carinate and the occipital carina strong; face scabrously punctate, centrally elevated, with the orbits and a line from antennæ to epistoma testaceous; clypeus discrete, more sparsely punctate and not apically elevated; palpi, apices of mandibles, and the external orbits in the centre, rufescent; cheeks distinct. *Antennæ* bright fulvous (17 millim. in length), not slender, with the scape and base of the laterally subsinuate first flagellar joint black. *Thorax* immaculate, short and stout, coarsely and scabrously punctate, with the metanotum strongly rugose, and all the pleuræ more finely and evenly punctate; notauli discally very deeply impressed but not crenulate, apically subobsolete; metanotum short, very strongly subtransversely rugose and with long black tomentum, laterally buccate basally, with the centre broadly, and at the apex deeply, excavate and trans-strigose. *Scutellum* distinctly convex, black, rugosely punctate and with long black tomentum, with no lateral carinæ. *Abdomen* discally linear, longer than twice the head and thorax, nitidulous black, with the apices of the two basal segments and the disc of the third obscurely badious; basal segment linear, glabrous and basally sulcate, with the spiracles shortly before the apex; terebra shorter than half the basal segment, rufescent, with the valvulæ black and apically suboblique. *Legs* slender and strongly elongate, black, with the front ones except basally, and the intermediate femora, dull ferruginous; hind trochanters, base of their tarsi and, more obscurely, of their tibiæ, dull castaneous; basal hind tarsal joint 4 millim. in length, the second $1\frac{1}{2}$ millim.; claws small and not pectinate. *Wings* unicolorous blackish throughout, with the nervures exactly as in the last species.

Length 26 millim.

Type in the Oxford Museum.

The extremely dark wings render this fine species very conspicuous; it is very closely allied to the Nearctic *E. tenuipes*, Nort. (Proc. Ent. Soc. Philadelphia, 1863, p. 360).

The type is labelled simply "India."

Genus MAGNIBUCCA, *Morl.*

Magnibucca, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 79.

GENOTYPE, *M. testacea*, Morl.

Head posteriorly much broader than the eyes, with the vertex broad and basally margined; occiput perpendicular and concave; mandibles stout, margined below, their teeth strongly obtuse apically, with the lower somewhat distinctly the shorter; eyes glabrous, internally parallel and not emarginate; clypeus apically rounded and slightly but obtusely produced centrally; face deplanate and not discrete; cheeks strongly buccate; frons laterally convex and with a very fine central carina. Notauli obsolete and hardly impressed; metathorax convex, with no carinæ; spiracles elongate, ovate and not small. Scutellum convex, large, apically subtruncate and laterally immarginate. Abdomen fully twice the length of the head and thorax, laterally compressed; basal segment glabrous and linear to its centre and thence gradually dilated to the subapical spiracles. Legs stout and not elongate, with the hind tarsi distinctly spatuliform, with calcaria hardly longer than the breadth of the tibial apex. Wings not ample; stigma distinct; basal nervure subpostfurcal, with the lower basal strongly oblique; first recurrent nervure emitted before centre of first cubital cell, which is apically strongly obtuse below; second recurrent nervure continuous with the submarginal, more than half fenestrate; anal nervure emitted far above centre of brachial cell; all nervures distinct to apices of wings; nervellus strongly intercepted very slightly below its centre.

Perhaps this genus is most closely allied in its continuous second recurrent to the *Laphyctes* group of the genus *Barylypa*, but the structure of the head is much closer to *Exochilum*; it is, however, entirely distinct in the structure of its vertex and occiput, and the peculiar coloration, which approximates it to *Labrorychus amabilis*, Tosq., from Transcaspia.

306. Magnibucca testacea, *Morl.*

Magnibucca testacea, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 80.

A large, stout and entirely testaceous species, with only the ocelli and disc of the second segment black. *Head* and *thorax* coarsely punctate, with only the metanotum somewhat smoother. *Antennæ* (broken) testaceous and multiarticulate, with the thirty or forty basal flagellar joints cylindrical; scape hardly excised. *Wings* distinctly flavescent, with the radix, tegulæ and stigma fulvous.

Length 23 millim.

MADRAS: Bangalore (*Cameron*).

Type in the Indian Museum.

Unfortunately I have seen but a single example of this very remarkable insect, and that in so bad a condition that I am unable to determine the sex.

Genus BARYLYPA, *Först.*

Barylypa, Förster, Verh. pr. Rheinl. 1868, p. 146.

GENOTYPE, *Anomalon perspicillator*, Grav.

Clypeus anteriorly rounded and not centrally produced; labrum not prominent. Tarsal claws not pectinate; hind femora simple. Areolet wanting; second recurrent continuous with submarginal nervure; first abscissa of cubital nervure obsolete or wanting; basal length of third discoidal cell not as broad as length of transverse median nervure; nervellus distinctly geniculate.

Range. Palæarctic Region.

This genus had simply been utilised as a subdivision of *Anomalon* up to 1901; but in 1906 several species were assigned to it from British India, since Ashmead had brought it into some prominence during 1900. Thomson (Opusc. Ent. xvi, p. 1766) differentiates it from *Trichomma* by its glabrous eyes, and from *Agrypon* by the second recurrent being continuous with the submarginal nervure and the nervellus being distinctly geniculate.

Cameron has constructed (Journ. Bombay Nat. Hist. Soc. 1906, p. 280) a mere colour chart of his five species, which may be of use and is given below; but something more than colour is necessary and a table, drawn from the type specimens in Colonel Nurse's collection, is appended.

"1 (4) The greater part of the head, thorax and apex of abdomen black.
2 (3) Large (15 millim.), the pleuræ yellow, black above, the flagellum of antennæ rufous, the basal two segments of abdomen rufous ...... *pilosella.*
3 (2) Small (9 millim.), the pleuræ black, with 3 yellow marks, the antennæ black, the basal 2 segments of abdomen for the greater part black .... *interstitialis.*
4 (1) The greater part of the body rufous.
5 (6) The mesonotum and base of metanotum maculate with black .... *variornata.*
6 (5) The mesonotum and metanotum not maculate with black.
7 (8) Large (16 millim.), the mesonotum yellow, with three rufous lines; mesopleuræ yellow, rufous above and below .... *rufo-lineata.*
8 (7) Small (8 millim.), the mesonotum rufous, yellow laterally at the base; mesopleuræ rufous, with two yellow marks .... *erythrocera.*"

Table of Species.

1	(4)	Lower basal emitted from median distinctly before upper basal nervure.	
2	(3)	Frons carinate; second broader than basal flagellar joint	*pilosella*, Cam., p. 416.
3	(2)	Frons not carinate; second not broader than basal flagellar joint	*rufolineata*, Cam., p. 417.
4	(1)	Basal subcontinuous through median nervure.	
5	(8)	Spiracles of second segment obsolete; frons carinate.	
6	(7)	Ocelli deplanate; nervellus nearly straight	*interstitialis*, Cam., p. 417.
7	(6)	Ocelli strongly convex; nervellus normally curved	*variornata*, Cam., p. 418.
8	(5)	Spiracles of second segment strong; frons not carinate	*erythrocera*, Cam., p. 419.

307. **Barylypa pilosella**, *Cam.*

Barylypa pilosella, Cameron, Journ. Bombay Nat. Hist. Soc. 1906, p. 277 (♂).

♂. A black species, with profuse flavous markings and rufescent abdomen. *Head* with long white pilosity; face, clypeus, internal orbits to above antennæ and very narrowly to near vertex, and the external orbits entirely, bright flavous; frons longitudinally carinate and rugosely punctate centrally, subobliquely striate above and laterally punctate. *Antennæ* short (length 9 millim.), brunneous, with the basal flagellar joints, and the flavous scape above, black. *Thorax* with long white hairs; apical half of the nitidulous and sparsely punctate mesonotum laterally (extending to apex of tegulæ), and the closely punctate pleuræ mainly (except mesopleuræ above), flavous; metanotum irregularly reticulate-striate, with a glabrous central longitudinal line. *Scutellum* flavous and much more strongly punctate than the mesonotum. *Abdomen* red, with the basal half of first, a discal stripe on second, apex of fifth, disc and apex of sixth and the seventh segments entirely, black; apical incisures narrowly flavous. *Legs* flavous, with the intermediate trochanters, and base of their femora above, black; hind legs with coxæ discally, femora and tibiæ both internally, and the two or three apical tarsal joints, black. *Wings* hyaline, with the stigma testaceous and the nervures black; second recurrent continuous with the submarginal nervure.

Length 17 millim.

Baluchistan: Quetta, v. 04 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species appears to be allied to *B. genalis*, Thoms., but it is larger and has more profuse flavous markings.

308. **Barylypa rufolineata**, *Cam.*

Barylypa rufolineata, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 278 (♀).

♀. A bright testaceous species, with flavous, and very inconspicuous black, markings. *Head* with dense white pubescence, flavous, with the vertex and occiput more broadly red; mandibles apically, the interocellar area, and the strong occipital carina, black; frons strongly punctate and obliquely striate below the ocelli, with the vertex less strongly punctate. *Antennæ* red (6 millim. in length), with the scape flavous; postannellus and basal flagellar joint blackish, the latter somewhat sharply curved, much narrower and nearly thrice as long as the second. *Thorax* with dense white pubescence, flavous, with three broad mesonotal stripes, base of the metanotum, pleuræ above, and the sternum, red; mesonotum basally sparsely, apically more strongly and closely, punctate, with its apical declivity more strongly and closely trans-aciculate; metanotum coarsely reticulate, and longitudinally sulcate centrally towards the apex; pro- and mesopleuræ closely and strongly punctate, with the metapleuræ coarsely reticulate. *Scutellum* strongly punctate, and, like the postscutellum, flavous; frenum red, with a black apical carina. *Abdomen* testaceous, with disc of second segment conspicuously black; petiolar spiracles shortly before the apex of the basal segment; terebra $2\frac{1}{2}$ millim. in length, spicula stramineous and acuminate, valvulæ blackish and apically subclavate. *Legs* flavescent, the anterior with the femora rufescent beneath; hind coxæ, trochanters and femora red, with the trochanters and tibiæ variegated with flavous and black, and their tarsi blackish. *Wings* hyaline, with the stigma dull testaceous, the costa and nervures black; second recurrent nervure continuous with the submarginal; basal by no means continuous through the median.

Fig. 118.
Barylypa rufolineata, Cam.

Length 16 millim.

BALUCHISTAN: Quetta, v. 04 (*Col. Nurse*).

Type in Col. Nurse's collection.

309. **Barylypa interstitialis**, *Cam.*

Barylypa interstitialis, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 278 (♂).

♂. A black species, with pale markings and white pilosity.

Head closely punctate; face, clypeus, orbits narrowly (except above), flavous. *Antennæ* black, becoming brunneous apically. *Thorax* closely, with the mesonotum nitidulous and more sparsely, punctate; hamate lateral marks on apex of mesonotum, propleuræ basally below, mesopleuræ broadly at the base and more narrowly at the apex below, and a large and obliquely constricted mark at apex of metapleuræ below, flavous; metanotum irregularly striate longitudinally and more weakly transversely, forming an irregular reticulation; metapleuræ more closely and rugosely punctate than the remainder. *Scutellum* flavous. *Abdomen* black, with the third to fifth segments testaceous-red and two basal infuscate. *Legs* flavous; intermediate coxæ basally and hind ones entirely, the hind trochanters above, base and apex of their dark red femora, their tibiæ internally and apically, and most of their tarsi, black. *Wings* hyaline; tegulæ flavous, costa and stigma pale testaceous, nervures black.

Length 9 millim.

BALUCHISTAN: Quetta (*Col. Nurse*).

Type in Col. Nurse's collection.

310. **Barylypa variornata**, *Cam.*

Barylypa variornata, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 279 (♀).

♀. A red and flavous species; the thorax with broad black markings. *Head* sparsely punctate; frons centrally carinate,

Fig. 119.—*Barylypa variornata*, Cam.

eyes strongly convergent apically; face, clypeus, mandibles, palpi, a subinterrupted line at the frontal orbits, and the external orbits (more broadly centrally), flavous; ocellar region and sometimes occiput black. *Antennæ* reddish or blackish, apically setaceous

(5½ millim. in length), with the scape flavous beneath; basal flagellar joint fully twice as long as the second. *Thorax* sparsely punctate and distinctly pilose; red, with mesonotum basally and centrally at the apex, mesosternum sometimes, and most of the metanotum and its pleuræ, black; large apical lateral marks on mesonotum, lateral marks on metanotum, on base and apex of mesopleuræ, and metapleuræ, flavous; mesonotum basally transstriate; metanotum irregularly longitudinally aciculate and often subreticulate. *Scutellum* flavous, with the frenum black. *Abdomen* testaceous and paler beneath; basal segment basally infuscate, with the spiracles shortly before its apex and sometimes prominent; second segment, and sometimes anus, discally black; terebra as long as the basal segment, red, with the valvulæ black and apically subclavate. *Legs*: anterior pairs flavous, with the red intermediate femora basally black; hind legs blackish, with the coxæ and the greater part of the femora red, and the tibiæ basally pale. *Wings* sometimes tinged with fulvous; second recurrent nervure continuous with the submarginal and fenestrate below its centre; stigma and costa luteous, the latter below and the nervures blackish; anal angle of front wings subcorneous from the sinus.

Length 10–12 millim.

Baluchistan: Quetta, viii. 03 and vi. 04 (*Col. Nurse*).

Type in Col. Nurse's collection.

311. **Barylypa erythrocera**, *Cam.*

Barylypa erythrocera, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 279 (♀).

♀. A bright red and flavous species, with no black markings. *Head* subpilose, with the orbits broadly, mandibles, palpi and the closely punctate face and clypeus, flavous; frons and vertex strongly punctate, with the former not centrally carinate; the strong occipital carina and ocelli, though not their intervening space, black. *Antennæ* clear red (4 millim. in length) and subfiliform throughout; scape flavous; postannellus and basal flagellar joint blackish, the latter exactly double the length of the second. *Thorax* bright red and without black markings; mesonotum laterally near apex, and pleuræ broadly, flavous; pro- and mesothorax sparsely and strongly punctate; the mesopleuræ more strongly, with their apices trans-aciculate; metanotum transreticulate, discally subimpressed and basally glabrous on either side; metapleuræ irregularly rugulose. *Scutellum* flavous. *Abdomen* testaceous and paler below, with the anus very slightly darkened and the disc of the second segment black; terebra as long as the basal segment, red, with the valvulæ black and subclavate. *Legs* red, with the anterior paler; hind trochanterellus, and apices of the internally darkened hind tibiæ, black; hind tarsi apically blackish. *Wings* hyaline and somewhat deter-

minately fulvescent discally, with the stigma, tegulæ and base of costa flavous; nervures black; second recurrent nervure continuous with the submarginal and the anal angle very obsoletely corneous.

Length 8 millim.

BALUCHISTAN: Quetta, viii. 03 (*Col. Nurse*).

Type in Col. Nurse's collection.

Genus **ANOMALON**, *Jur.*

Anomalon, Jurine, Hym. 1807, p. 114; Gravenhorst, Ichn. Eur. iii, 1829, p. 627.

GENOTYPE, *A. cerinops*, Grav.

Mandibular teeth of subequal length; eyes glabrous (nec *Trichomma*). Thorax with normal pubescence. Areolet entirely wanting (nec *Metanomalon*); stigma distinct; first recurrent nervure emitted at some distance before centre of first cubital cell, the lower side of which is distinctly angled above its juncture (nec *Schizoloma, Heteropelma, Exochilum*); second recurrent nervure emitted from external cubital distinctly beyond the submarginal and not continuous with the latter (nec *Barylypa*). Neuration of hind wings complete to apex (nec *Clatha*); and the nervellus distinctly geniculate and intercepted (nec *Agrypon*).

Range. World-wide.

I have seen so few of Cameron's species of this genus and his descriptions are so inadequate in respect of the neuration that it is thought expedient for the present not to adopt the various subgenera of Förster (they are worthy of no higher title), into which this genus has recently been divided. I will only point out that *A. apicale* belongs to *Labrorychus*, Först. (Verh. pr. Rheinl. 1868, p. 146) and doubtless the same author would have erected a new genus—of equal instability with his *Pterocormus* (*cf.* Wiegm. Arch. 1850, p. 72)—for the first of the following species. Cameron's descriptions, unfortunately, preclude anything but a colour table of this genus.

Table of Species.

1	(2)	Wings extending only to apex of postpetiole	*brachypterum,* Cam., [p. 421.
2	(1)	Wings extending at least to centre of abdomen.	
3	(4)	Metathorax broadly red-marked; frons carinate	*carinifrons,* Cam., p. 421.
4	(3)	Metathorax immaculate black.	
5	(6)	Radical callosities flavous	*decorum,* Cam., p. 422.
6	(5)	Thorax entirely immaculate.	
7	(10)	Scutellum flavous.	
8	(9)	Hind tibiæ broadly black	*tinctipenne,* Cam., p. 422.
9	(8)	Hind tibiæ entirely red	*apicale,* Cam., p. 423.
10	(7)	Scutellum not flavous	*binghami,* Cam., p. 424.

312. **Anomalon brachypterum**, *Cam.*

Anomalon brachypterum, Cameron, Manch. Mem. 1897, p. 25 (♂).

♂. *Head* closely punctate and black, the face with dense white pubescence; mandibles testaceous and the palpi white. *Antennæ* black and shortly pubescent; scape flavous beneath. *Thorax* immaculate and rugose, anteriorly with sparse and posteriorly with dense white hairs; metanotum gradually sloping throughout. *Abdomen* more than twice the length of the head [? and thorax]; basal segment longer than the second, apically nodose and brunneous, basally black; second testaceous and, like the two apical, discally black; remainder rufo-testaceous. *Legs*: anterior pairs pale stramineous; hind ones black, with the trochanters, calcaria and apices of femora, pale stramineous. *Wings* hyaline, short and hardly extending beyond apex of postpetiole; nervures black.

Length 9 millim.

CEYLON: Trincomali (*Col. J. W. Yerbury*).

313. **Anomalon carinifrons**, *Cam.*

Anomalon carinifrons, Cameron, Manch. Mem. 1899, p. 113 (♀).

♀. *Head* black, with the face, clypeus, mandibles (except apically), palpi, subtriangular vertical dots, and the external orbits, flavous; frons and vertex closely but not strongly rugulose, with the frontal orbits margined; frons with a stout and apically dilated inter-antennal carina; clypeus less strongly punctate than the longitudinally subcarinate face, and apically subglabrous. *Antennæ* with both scape and flagellum rufescent, with the underside flavidous, and the second and third joints entirely deep black. *Thorax* black, with the pronotum basally, narrow lateral lines, elongate callosities before and behind radices, and the apical half of metapleuræ (and of metanotum), red; mesonotum uniformly and very closely punctate, with short dense black pubescence; metanotum closely rugose basally, "in the middle are two indistinct keels forming an area, the rest reticulated, the reticulations longer at the sides and apex"; propleuræ basally carinate and very finely punctate, coarsely punctate above and irregularly striate below; mesopleuræ closely punctate, centrally subimpressed and basally substriate below; mesosternum laterally aciculate; metapleuræ coarsely reticulate, basally glabrous, with a margined testaceous fovea on either side. *Scutellum* more strongly and less closely punctate than the mesonotum. *Abdomen* rufescent-fulvous, with the second segment alone discally black. *Legs*: anterior pairs fulvous, with the coxæ subflavidous; hind legs red, with their tarsi flavous and the apices of the tibiæ broadly black, their coxæ and trochanters sometimes slightly blackish. *Wings* fulvescent hyaline; stigma fulvous, costa darker.

Length 16 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

314. **Anomalon decorum**, *Cam.*

Anomalon decorum, Cameron, Manch. Mem. 1897, p. 24 (♀).

♀. *Head* nitidulous and with sparse white pubescence, flavous, with the vertex broadly in its centre, occiput (except laterally), and extreme apices of mandibles, black; eyes strongly convergent, and not further apart than double the width of the scape, apically. *Antennæ* (broken) with the scape flavidous beneath. *Thorax* black, with the pronotum broadly, and the radical callosities, flavous; mesonotum dull, with its central lobe elevated; metanotum and metapleuræ reticulate; pro- and meso-pleuræ longitudinally striolate, more closely above. *Scutellum* flavous. *Abdomen* testaceous beneath; basal segment black, glabrous and nitidulous, with its apical third widened and the disc elongately impressed; terebra 3 millim. in length. *Legs*: anterior pairs, and all the coxæ and trochanters, flavous; [? hind] tibiæ and femora infuscate beneath, and the tarsi apically black. *Wings* hyaline, extending to centre of abdomen; tegulæ flavous.

Length 10 millim.

CEYLON: Trincomali (*Col. Yerbury*).

315. **Anomalon tinctipenne**, *Cam.*

Anomalon tinctipenne, Cameron,* Manch. Mem. 1899, p. 112 (♀); *cf.* Ann. Nat. Hist. xx, 1907, p. 14.

♀. *Head* black, with the face, clypeus, frontal (subinterrupted from vertical) orbits, external orbits narrowly, mandibles (except their teeth), and palpi, flavous; frons stoutly and obliquely striate laterally, more feebly and subreticulately in the centre; epistoma circularly prominent, with long white pubescence and large isolated punctures; clypeus impressed centrally and glabrous at its apex, sparsely punctate at its base. *Antennæ* clear red, with basal half of the flagellum darker; scape with dense long pale pilosity, flavidous above. *Thorax* immaculate; mesonotum punctate, laterally more sparsely and basally subreticulate, with its central lobe elevated and the disc subcanaliculate: metathorax strongly reticulate, with dark hairs basally and laterally; propleuræ basally aciculate, striolate centrally above and below; mesopleuræ irregularly reticulate basally and above, closely punctate below and centrally subglabrous, with their apices impressed and crenulate; metapleuræ basally glabrous, apically bordered above the isolated punctures, and stoutly striate below. *Scutellum* flavous, submarginate and strongly punctate laterally, depressed discally, with its sides centrally red. *Abdomen* ferruginous, with the second segment discally black and the basal centrally infuscate. *Legs* pale fulvous, with the anterior trochanters flavidous; hind legs dark ferruginous, with apices of their tibiæ very broadly black and of their tarsi subflavidous. *Wings* hyaline with a dark fulvous tinge, the stigma dark fulvous; transverse cubital nervure shorter than the basal cubital abscissa.

Length 22 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the British Museum.

The broken type of this species shows very remarkable venation: the median nervure runs straight to its junction with the cubital, which is strongly sinuate and only extends to the centre of the first cubital cell; the second recurrent nervure above is four times further from the apex of the internal cubital than the latter is from the radial; nervellus subopposite and strongly intercepted a little below the centre.

316. **Anomalon apicale**, *Cam.* (emend.).

Anomalon apicale, Cameron,* Entom. 1905, p. 106 (♂).
Anomalon leptogaster, Cam. MS. ♂.

♂ ♀. *Head* black; face flavous, closely and distinctly punctate, with dense white pubescence; clypeus flavous, closely punctate basally and subglabrous apically; vertex also closely punctate; frons in the centre irregularly striate longitudinally and closely aciculate transversely; palpi and mandibles, except apices of latter, flavous. *Antennæ* testaceous (13 millim. in length), becoming infuscate towards their apices; postannellus and basal half of the strongly sinuate first flagellar joint black. *Thorax* immaculate black; mesonotum closely and somewhat strongly punctate and discally elevated at the apex, with its base irregularly trans-strigose centrally; metanotum at the base closely and rugosely subreticulated; the lateral carinæ evenly curved; the basal area smooth; the apex constricted into a distinct neck, and irregularly transversely striate; propleuræ coarsely reticulate and, above, closely punctate; mesopleuræ longitudinally striate above and closely punctate below; metapleuræ coarsely and irregularly reticulate. *Scutellum* and postscutellum flavous and coarsely punctate. *Abdomen* extremely slender, red, with the disc of the second and third segments indistinctly black, and the two apical entirely jet-black. *Legs* red; the anterior subflavidous, with their coxæ and trochanters substramineous; hind tarsi substramineous, with only the pulvilli dark. *Wings* hyaline and not ample, becoming fulvescent towards the base; tegulæ flavous, stigma testaceous and nervures black; nervellus distinctly intercepted and geniculate.

Fig. 120.
Anomalon apicale, Cam.

Length 11–16 millim.

Punjab: Simla, viii. and ix. 98 (*Col. Nurse*): United Provinces: Mussoori, 7000 ft., x. 06 (*H. M. Lefroy*—Pusa coll.); Assam: Shillong, iv. 03 (*Rowland Turner*).

Type in Coll. Nurse's collection.

This is an extremely slender insect and appears to be closely allied to *Labrorychus clandestinus*, Grav., though the metatarsus is nearly or quite thrice as long as the second hind tarsal joint. Cameron sent a female of this species to the British Museum labelled "type"; but he described only the male sex, giving the length at 16 millim., and this female is only 11 millim. in length; it was captured with Nurse's true type.

317. **Anomalon binghami**, *Cam.*

Anomalon binghami, Cameron, Ann. Nat. Hist. xx, 1907, p. 14 (♂).

♂. A black species, with the head flavous-marked and the abdomen ferruginous. *Head* with white pubescence, the clypeus. mandibles, cheeks, the strongly and sparsely punctate face, and the apical third of the inner orbits broadly, flavous; frons stoutly and obliquely reticulate throughout, vertex strongly and deeply nctate. *Antennæ* testaceous-red, with the basal half black above, and the scape flavous beneath. *Thorax* immaculate; mesonotum strongly, stoutly and subconfluently punctate, its base stoutly trans-striate; metanotum and its pleuræ more widely reticulate, with a broad and superficial central impression; propleuræ stoutly striate, and above distinctly punctate; mesopleuræ longitudinally and coarsely reticulate above, with its apex centrally glabrous and nude, and the remainder distinctly punctate and with black hairs. *Scutellum* rugosely reticulate and centrally broadly depressed. *Abdomen* pale ferruginous, with the two basal segments dorsally black. *Legs*: anterior pairs yellowish fulvous, with the coxæ and trochanters flavous; hind legs red, with the apical third of the tibiæ, trochanters and coxæ above black, apical joints of tarsi and coxæ flavous centrally beneath. *Wings* fulvescent hyaline, with the tegulæ flavous, stigma testaceous, costa and nervures black; transverse cubital nervure as long as the basal cubital abscissa.

Length 22 millim.

Sikkim (*Col. Bingham*).

This species differs from *A. tinctipenne* in its stoutly reticulate frons which has its flavous orbits of uniform width and the vertical immaculate, in the stouter carinæ, more coarsely and sparsely and isolatedly punctate mesonotum, and in the comparative length of the transverse cubital nervure.

Genus **AGRYPON**, *Först.*

Agrypon, Förster, Verh. pr. Rheinl. 1860, p. 151.

Genotype, *Ophion flaveolatum*, Grav.

Head with the eyes not, or scarcely, pubescent. Antennæ

often as long as the body. Thorax not very densely tomentose. Trochanters not or hardly longer than the trochanterelli; hind calcaria not longer than the apical breadth of their elongate tibiæ. First recurrent nervure emitted very distinctly before the centre of the first cubital cell; second recurrent emitted beyond the submarginal nervure; anal nervure emitted above the centre of the first recurrent nervure. Hind wings with the nervures more or less distinct to the apical margin; basal radial abscissa not longer than the recurrent nervure; nervellus neither geniculate nor intercepted.

Range. World-wide.

This genus is extremely like *Anomalon* in almost every particular, though its species are usually smaller and more slender insects, except that the nervellus is not geniculate and emits no trace of a nervure.

Table of Species.

1 (4)	Metanotum coarsely reticulate; face entirely pale.	
2 (3)	Frontal orbits pale; tarsi dilated	*nox*, Morl., p. 425.
3 (2)	Frontal orbits black; tarsi normal ..	*varitarsum*, Wesm., p. 426.
4 (1)	Metanotum finely rugose; face only laterally pale	*tisiphone*, Morl., p. 427.

318. **Agrypon nox**, *Morl.*

Agrypon nox, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 91.

♂ ♀. *Head* black, with the face, clypeus and mouth, the frontal and vertical orbits, and the whole cheeks externally, flavous; eyes entirely glabrous; frons with neither an apical horn nor a central carina. *Antennæ* 14 millim. (body 20 millim.) in length, dark, with the scape alone entirely flavous. *Thorax* without red markings; mesonotum rugosely punctate and dull, with very obsolete notauli; metanotum coarsely reticulate throughout. *Scutellum* black, not strongly convex, nor with its lateral carinæ prominent. *Abdomen* red; its second segment discally black and the anus somewhat darkened. *Legs* slender and red, with only the hind tibiæ broadly black at their apices; front coxæ transversely carinate; hind tibiæ not basally constricted, their tarsi spatuliform. *Wings* with the first recurrent emitted far before the centre of the first cubital cell; internal cubital nervure curved; second recurrent emitted beyond the submarginal

Fig. 121.
Agrypon nox, Morl.

nervure; nervellus strong, straight and not intercepted; the external nervures of the hind wing not wanting.

Length 16–20 millim.

United Provinces: Dehra Dun, xi. 11 (*Dr. A. D. Imms*), Mussoori, 7000 ft., vi. 05 (*E. Brunetti*—Ind. Mus.); Assam: Shillong (*Rowland Turner*—Brit. Mus., *La Touche*—Ind. Mus.); Burma: Karen Hills, 3000–3700 ft., vi. 88 (*L. Fea*).

Type in the Oxford Museum.

This species appears to differ from *A. stenostigma*, Thoms., in little but the very distinctly trans-carinate front coxæ, which feature allies it more closely with *A. anxium*, Wesm.; it is, however, much larger than either.

The typical ♂ was captured in "India" by Capt. Boys.

319. **Agrypon varitarsum**, *Wesm.*

Anomalon varitarsum, Wesmael, Bull. Ac. Brux. 1849, p. 131 (♂ ♀).
Anomalon varitarse, Holmgren, Öfv. Sv. Ak. Förh. 1857, p. 185; id., Sv. Ak. Handl. 1858, p. 29 (♂ ♀).
Agrypon varitarsis, Thomson, Opusc. Ent. xvi, 1892, p. 1769 (♂ ♀).
Agrypon varitarsum, var. *ruficoxis*, Szépligeti, Term. Füz. xxii, p. 232.

♂ ♀. A slender, black species, with red legs and abdomen. Head posteriorly dilated, black, with the mandibles centrally, clypeus, face, cheeks and (in the typical form) dots on the vertex, flavous. *Antennæ* black, rarely ferruginous, and nearly as long as the body; scape flavidous beneath. *Thorax* black, with humeral callosities and sometimes elongate lines before radices, flavous; metathorax often apically rufescent. *Scutellum* black, or with its basal angles reddish. *Abdomen* red, with the base of the first, disc of the central, and nearly the whole of the apical, segments black; terebra shortly exserted. *Legs* red, with the anterior paler and their base in ♂ flavescent; hind coxæ sometimes basally, rarely entirely, black; their tibiæ apically, and often the extreme base of their femora, black; hind tarsi not strongly spatuliform, and variable in coloration. *Wings* subhyaline, with the stigma piceous and the tegulæ flavous; anal nervure emitted from far above the centre of the brachial cell; nervellus straight and not intercepted.

Length 12–15 millim.

Rajputana: Mt. Abu (*Col. Nurse*); United Provinces (*Mrs. Horne*); Assam: Margherita and Sadiya (Ind. Mus.); Tenasserim: Dawna Hills, iii. 08 (*N. Annandale*). Europe.

Type in the Brussels Museum.

The variety *ruficoxis*, Szépl.* differs in having the pale spots on the vertex wanting, and this form occurs also in India.

* Szépligeti's mode of synonymy in the "Genera Insectorum" is distinctly curious. He places (*l. c.* 1905, fasc. xxxiv, p. 17) this variety under both *Agrypon rubricatum*, Först. and *A. varitarsum*, Wesm.; he gives Förster's species as good, at the same time terming it a variety of Wesmael's.

This is not a very common species, though it occurs throughout northern and central Europe, and is perhaps most frequent in Sweden.

320. **Agrypon tisiphone,** *Morl.*

Agrypon tisiphone, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 92.

♀. *Head* black and with long silvery pubescence, with only the internal orbits to above the scrobes indeterminately stramineous, and the mouth and the apex of the clypeus transversely, flavous; eyes entirely glabrous; frons feebly carinate centrally, with no apical horn. *Antennæ* 12 millim. in length, entirely dusky, with the scape black throughout. *Thorax* with no red or flavous markings; mesonotum transversely scabrous and very dull, with no notauli; metanotum somewhat finely subrugulose and with white pubescence. *Scutellum* black and subconvex. *Abdomen* black, with the third to fifth segments and the whole terebra fulvous; terebra 1 millim. in length. *Legs*: anterior pairs slender and flavidous, with the onychii alone dark; hind legs stouter and black, with only the femoral apices sub-badious; front coxæ not carinate; hind tibiæ not basally constricted, their tarsi somewhat broad. *Wings* with the first recurrent emitted before the centre of the first cubital cell; internal cubital nervure curved; second recurrent emitted beyond the submarginal nervure; nervellus strong, straight and not intercepted; nervures of hind wing distinct to apex.

Length 12 millim.

Bengal: Calcutta (Ind. Mus.); Ceylon: Kandy, vi. 09 (*E. E. Green*, type).

Type in the author's collection.

It is allied to *A. anomelas*, Grav., but at once known therefrom by the elongate antennæ and scabrous mesonotum.

Genus **CLATHA**, *Cam.*

Clatha, Cameron, Spolia Zeyl. 1905, p. 129.

Genotype, *C. longipes*, Cam.

Head glabrous and nitidulous; eyes nude and apically convergent; occiput margined and transverse; mandibular teeth large and unequal in length; clypeus apically rounded. Antennæ filiform and longer than the body. Mesonotum and scutellum rugosely punctate. Legs with the tarsal claws small and simple; hind legs very long, with their tibiæ as long as the trochanters and femora united, sinuate and basally constricted; the trochanter about four times the length of the trochanterellus; and their metatarsus as long as the remaining tarsal joints united. Wings with the basal nervure continuous through the median; internal cubital nervure continuous with the discoidal, and basally rounded; second discoidal cell one-third broader

apically than basally, the third discoidal basally narrowed and pointed. Hind wings with but two complete cells; a large anterior, extending to shortly beyond the centre with its apex broadly rounded; and a shorter posterior, not extending to the centre of the anterior, with its apex straight and suboblique, formed by the anterior nervure constituting "one piece, it being in one continuous rounded curve; the second nervure is joined to it by a transverse nervure."

Range. Ceylon.

This genus is said to be closely related to *Agrypon*, Först. (Verh. pr. Rheinl. 1860, p. 151), as defined by Ashmead (Proc. U.S. Nat. Mus. 1900, p. 89), and to be readily recognised by the total lack of apical nervures in the hind wing. I have not seen the single known species.

321. Clatha longipes, *Cam.*

Clatha longipes, Cameron, Spolia Zeylanica, 1905, p. 130 (♀♂).

A testaceous-red species, with profuse black markings. *Head* flavous, with the face darker above and the disc of the vertex transversely black. *Antennæ* black, with their base testaceous beneath. *Thorax* with a discal mesonotal stripe extending from apex to near base, with a shorter and broader stripe on each lateral lobe, the scutellar fovea, a discal and two lateral stripes on the metanotum, and basal metapleural lines, black; metanotum closely reticulate; pleuræ coarsely and rugosely reticulate, with the centre of the propleuræ striate and with black lines, mesopleuræ with narrow black lines and centrally striate. *Scutellum* black at base and apex. *Abdomen* with the two basal segments rufescent, as long as the thorax, slender and of equal length, with the first apically broadened (the remaining portion missing). *Legs* densely and shortly pilose; the anterior yellowish testaceous; hind ones black, with their coxæ, except an external line, testaceous, and their femora with a testaceous ray below. *Wings* hyaline, with the stigma and nervures black.

Length 9 millim. (to the end of the second abdominal segment).

CEYLON: Kandy (*E. E. Green*).

Genus TRICHOMMA, *Wesm.**

Trichomma, Wesmael, Bull. Ac. Brux. 1849, p. 25.

GENOTYPE, *Ichneumon enecator*, Rossi.

Head normally buccate posteriorly, and contracted towards the

* Ashmead in 1900 revived the name *Theridium*, Curt., for this genus, since it was so called by Förster (Verh. pr. Rheinl. xxv, p. 145) in 1868, though he did not know the reference. The latter's application is, however, entirely arbitrary and incorrect. The genus *Therion* was erected, with no description, by Curtis in his "Guide" of 1829, col. 101, and of 1837, col. 112; it is

mouth; eyes broader below, internally broadly emarginate and distinctly pubescent; clypeus obsoletely discrete basally, subproduced centrally at the apex; labrum concealed; mandibular teeth acute, with the lower slightly the shorter. Antennæ hardly longer than half the body, with the scape apically subtruncate and hardly emarginate. Mesonotum rugosely punctate, with the notauli often very indistinct; metathorax extending distinctly beyond base of hind coxæ. Scutellum flavous, apically reflexed or subemarginate. Abdomen slender and compressed; terebra longer than the basal segment, with linear valvulæ. Hind legs somewhat stout, with the claws slender; tarsi incrassate, with the basal joint about double the length of the second, trochanter longer than trochanterellus. Anal nervure emitted from nearly the centre of the first recurrent, lower basal oblique and postfurcal; nervellus neither intercepted nor geniculate.

Range. United States, Europe, Africa, India, Ceylon, Malaya.

The distinctly pilose eyes will at once distinguish this genus from the remainder of the ANOMALIDES, except certain *Agrypon*, in which they are but obsoletely pubescent.

The Indian species have the head anteriorly buccate and posteriorly truncate, with the orbits very broadly pale.

Table of Species.

1 (2) Metathorax hardly produced apically; scutellum convex and flavous .... *nigricans*, Cam.
2 (1) Metathorax elongately produced; scutellum deplanate and black .... *productor*, Morl.

322. Trichomma nigricans, *Cam.*

Trichomma nigricans, Cameron, Spolia Zeylanica, 1905, p. 130 (♀).

♂ ♀. A black and linear species, with flavous markings on the head and thorax. *Head* glabrous, with white pubescence and

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adopted in place of *Anomalon*, Grav., in his "British Entomology" (pl. et fol. 736, April 1839), as he there explains: "Having published the genus *Anomalon* before Gravenhorst's work appeared, it may appear necessary to give my reasons for rejecting some of his names in the Guide. 1st, BASSUS of Fabricius is Gravenhorst's 3rd family of *Cryptus*, *seductorius* being the type given in the Piezatorum; 2ndly, Jurine's 1st family of ANOMALON, which of course is his type, Gravenhorst has called *Bassus*. 3rdly, Jurine's 2nd family of *Anomalon* I have called THERION, because it is not the typical *Anomalon*." The type of his genus *Therion* is *Ichneumon amictus*, Fab. (Syst. Ent. p. 341), but he also catalogues, without description, species now referred to four or five different genera of ANOMALIDES; and the only new species he brings forward was thought by Bridgeman and Fitch, in 1884, to be a variety of a Gravenhorstian *Anomalon*. If *Therion* be adopted at all, it must be *Schizoloma*, Wesm., and not *Trichomma*, which falls.

posteriorly truncate; eyes large, pilose, convergent apically and internally emarginate; cheeks wanting; the prominent face, clypeus, all the orbits and the apically subequidentate mandibles, flavous; frons with a band of striæ, constricted below; occiput margined and not quite transverse; temples not constricted. *Antennæ* black, with the scape flavous beneath. *Thorax* with dense silvery pubescence, black, with a broad and apically constricted anteradical flavous patch on either side; mesonotum nude, dull and basally transstriate, with the distinct notauli and their basal region irregularly reticulate; metathorax not caudately produced apically; metanotum and its pleuræ coarsely reticulate, with the apices of the propleuræ strongly above, and the mesopleuræ more finely and closely, strigose. *Scutellum* subconvex, flavous and glabrous, distinctly transverse and laterally carinate throughout. *Abdomen* black and immaculate, with the terebra less than half its length. *Legs* black, with the anterior coxæ and trochanters entirely stramineous, their femora and tibiæ in front, and the front femora entirely, flavous; hind coxæ broadly basally above or entirely, and all the calcaria, flavous; hind trochanter more than double the length of the trochanterellus, their femora basally constricted. *Wings* hyaline, with the tegulæ flavous, the stigma and nervures black; second recurrent emitted beyond the submarginal nervure; basal nervure not continuous through the median; second discoidal cell not much broader apically than basally, the third double its basal breadth at its apex; nervellus not intercepted.

Fig. 122.
Trichomma nigricans, Cam.

Length 10–17 millim.

UNITED PROVINCES: Dehra Dun and Mussoori (Ind. Mus.); ASSAM: Sadiya, Margherita and Ukhrul (Ind. Mus.); CEYLON: Kandy, vi.–ix. (*E. E. Green*, type; *O. S. Wickwar*), Hakgala, ii. 07, and Maskeliya, viii. 05 (*E. E. Green*).

The hind coxæ vary in colour from entirely pale stramineous to mainly black with a flavescent discal mark; the hind tibiæ are sometimes entirely, but not broadly, red-banded before their subattenuate base; and the fourth and following segments are often laterally, with the ♂ valvulæ always entirely, rufescent.

This fine species is most closely related to *T. enecator*, Rossi, but it is usually much larger and black, with nitidulous and flavous scutellum and orbits.

In Europe, the species of this genus are known to prey upon a very few of the larger Tortricid moths, but Mr. Green has bred the present species from the larval case of a Tineid moth.

323. **Trichomma productor**, *Morl.*

Trichomma productor, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 66.

♂. A linear black species, with the face, orbits and hind tarsi alone flavous; legs and abdomen nearly entirely red; scutellum strongly deplanate and black; metanotum elongately produced above the petiole.

Length 14–15 millim.

UNITED PROVINCES: Mussoori, x. 06 (*H. M. Lefroy*—Pusa coll.).

Type in the author's collection.

This species has much the facies of *T. nigricans*, but differs in many details of both structure and colour. The head is similarly coloured, but with the frons and vertex much more scabrously punctate; face with longer pubescence; mesonotal notauli wanting, with no pale anteradical lines; metanotum more finely sculptured, with the apical metathoracic process occupying fully a third of its total length and quite parallel-sided; scutellum black, quadrate, strongly deplanate and centrally sulcate; abdomen red, with the disc of the second segment alone black, and the anus hardly darkened; all the legs red, with the apices of the hind tibiæ alone black; hind coxæ cylindrical and much narrower; internal cubital nervure much less sinuate and the anal emitted distinctly further from centre of the first recurrent nervure. The eyes are much less distinctly pubescent.

I have examined two males of this species.

Genus **METANOMALON**, *Morl.*

Metanomalon, Morley, Rev. Ichn. Brit. Mus. ii, 1913, p. 58.

GENOTYPE, *M. poliendum*, sp. n.

Eyes glabrous, strongly approximating apically and not internally emarginate; face constricted to the discrete and tuberculiform clypeus; frons trans-sulcate above the scrobes, with neither carina nor horn. Antennæ very slender and filiform, with the elongate flagellar joints cylindrical; scape pale, short and obliquely truncate. Thorax not unusually pubescent; mesonotum entirely glabrous and very strongly nitidulous, with its central lobe considerably elevated; notauli very deeply impressed and strongly crenulate, determinately coalescing discally; metathorax shining, sparsely sculptured, with distinct areæ and its apex not produced above base of the hind coxæ; spiracles circular. Scutellum entirely glabrous, very strongly nitidulous and bordered to near apex. Postpetiole not or hardly thicker than the petiole; second segment centrally impressed, linear, distinctly longer than the first and double the length of the third. Hind legs with the tarsi not or hardly dilated; calcaria longer than apical width of tibiæ; claws minute, femora and tibiæ basally constricted.

Areolet subcomplete and sessile, its outer nervure weak and obsolete in its lower half, but with the external cubital distinctly recurved beyond the second recurrent nervure; stigma distinct though narrow; second recurrent emitted far beyond the first submarginal nervure; anal nervure emitted from but slightly above centre of first recurrent, which is distinctly before centre of first cubital cell; basal nervure continuous through the median; internal cubital somewhat strongly curved; nervellus strong, straight and not intercepted; neuration of hind wings strong to apex, with the basal abscissa of the radial as long as the recurrent nervure.

Range. Ceylon.

In the conformation of the abdomen and, except the somewhat distinct areolet, of the wing, this genus is essentially Anomaloid; but the entirely glabrous mesonotum and scutellum, its general paucity of sculpture and subentire areolet, the apically unproduced metathorax, and subnormal hind tarsi, appear to preclude it therefrom; it is even less conformable to the CAMPOPLEGIDES or Pimplid THYMARIDES, though in some respects allied to *Diadegma*, Morl. In default of a better position and a knowledge of the ♀, I leave it provisionally among the ANOMALIDES, where it is most closely allied to *Agrypon*, though the calcarial length is fully double the apical tibial breadth.

324. **Metanomalon poliendum**, *Morl.*

Metanomalon poliendum, Morley, *l. c.* p. 59.

♂. Black, with the mouth, scape, tegulæ and front coxæ, stramineous; metathorax entirely, mesopleuræ and their sternum,

Fig. 123.—*Metanomalon poliendum*, Morl.

anterior legs, hind coxæ and trochanters, basal half of first segment, with base of third and fourth, and venter broadly,

pale testaceous; hind legs infuscate, with rufescent markings. Metanotum subnitidulous and glabrous, with very sparse and fine punctation, and complete though indistinct areæ; basal area cordiform and twice as long as broad, areola subparallel-sided and also twice as long as broad, with the strong costulæ emitted near its base; petiolar area finely reticulate and very distinctly discrete.

Length 8 millim.

CEYLON: Kandy, vi. 07 (*E. E. Green*).

Type in the author's collection.

Tribe *CAMPOPLEGIDES*.

This tribe comprises probably half the species of OPHIONINÆ throughout the world; its less conspicuous members are abundant everywhere, both as parasites of the first degree and as hyperparasites, through numerous species of BRACONIDÆ, on the smaller Lepidoptera. It is easily recognised from the following tribes by its comparatively narrow stigma and radial cell, and the irregularly triangular or wanting areolet; from the preceding tribe it is known by the second recurrent nervure always emanating beyond the submarginal nervure, and by its simple tarsi and metathoracic apex. Most of the species are recorded from temperate regions, where they are appallingly numerous, and no doubt can be entertained that we at present know but a tithe of those occurring in the Himalayas. Certain genera, especially those lacking the areolet, do not appear uncommon at lower altitudes, though they have been but little collected, on account of their inconspicuous size. Authorities are by no means agreed respecting generic values in this tribe at present, and, I think unfortunately, Förster's typeless subgenera have become largely adopted as genera by recent authors. In any case, the ponderous mass of descriptions must be subdivided and, since nothing but minute distinctions are available, the following table may be found of some assistance in discriminating between our indigenous genera.

I am glad to have had the opportunity of examining the majority of Cameron's typical specimens of *Limnerium*, since it would have been quite impossible from his isolated descriptions to have conceived the least idea of their systematic position; he appears to have employed the genus in its very widest sense.

Table of Genera.

1 (18) Metathoracic spiracles linear or elongate.

2 (9) Wings with no areolet; metathorax short.

3 (6) Clypeus not discrete; notauli wanting.

4 (5) Eyes internally strongly emarginate; scutellum deplanate ...... CHAROPS, Holmg., p. 435.

5 (4) Eyes only slightly emarginate; scutellum subconvex .... HYMENOBOSMINA, D. T., [p. 438.

6 (3) Clypeus discrete; notauli short but distinct.

7 (8) Frontal orbits normal; scutellum striate; mandibles equal ...... TRATHALA, Cam., p. 442.

8 (7) Frons tumidous; scutellum punctate; mandibles unequal ...... CEPHALOBOLUS, gen. nov., [p. 444.

9 (2) Wings with areolet more or less distinct; metathorax normal.

10 (17) Scutellum not laterally carinate.

11 (14) Abdomen compressed from second segment.

12 (13) Areolet minute; tibiæ strongly spinulose .... XANTHOCAMPOPLEX, gen. [nov., p. 445.

13 (12) Areolet large; tibiæ not or obsoletely spinulose .... CAMPOPLEX, Grav., p. 447.

14 (11) Abdomen compressed at most from third segment.

15 (16) Metathorax not sloping throughout nor apically produced .... ZACHRESTA, Först., p. 465.

16 (15) Metathorax sloping throughout, produced over hind coxæ ...... RHIMPHOCTONA, Först., [p. 466.

17 (10) Scutellum laterally carinate throughout .... DELOPIA, Cam., p. 468.

18 (1) Metathoracic spiracles spherical or subcircular.

19 (22) Wings with no areolet.

20 (21) Terebra hardly exserted .... ERIOBORUS, Först., p. 469.

21 (20) Terebra distinctly exserted ...... DIOCTES, Först., p. 470.

22 (19) Wings with distinct areolet.

23 (26) Eyes internally strongly emarginate; abdomen often apically clavate.

24 (25) Abdomen hardly clavate apically; terebra exserted .... TROPHOCAMPA, Schm., [p. 475.

25 (24) Abdomen clavate apically; terebra not exserted .... CASINARIA, Holmg., p. 476.

26 (23) Eyes internally not or hardly emarginate; abdomen not clavate.

27 (28) Radial angled at submarginal nervure; claws pectinate ...... SINOPHORUS, Schm., [p. 477.

28 (27) Radial simply curved at submarginal nervure; claws often simple.

29 (30) Head discally subcubical; claws distinctly pectinate .... OLESICAMPA, Thoms., [p. 478.

30 (29) Head transverse, disc narrow; claws basally subpectinate.

31 (32) Metanotum excavate throughout; discoidal cell rectangular ...... LIMNERIUM, Ashm., p. 480.

32 (31) Metanotum not excavate; discoidal cell apically subacute.

33 (34) Spiracles of second abdominal segment beyond its centre .... IDECHTHIS, Först., p. 492.

34 (33) Spiracles of second abdominal segment before its centre.	
35 (36) Basal nervure oblique; terebra not or hardly exserted	ANILASTA, Thoms., p. 493.
36 (35) Basal nervure subvertical; terebra distinctly exserted	ANGITIA, Holmg., p. 496.

Genus CHAROPS, *Holmg.*

Charops, Holmgren, Sv. Ak. Handl. 1858, no. 8, p. 39; Öfv. Sv. Ak. Förh. 1858, p. 324.

GENOTYPE, *Campoplex decipiens*, Grav.

Head transverse and not buccate; clypeus not discrete; mandibles of normal breadth, with the teeth of subequal length; eyes internally strongly emarginate. Antennæ filiform and hardly longer than half the body. Metanotum not sloping throughout; petiolar area not excavate; spiracles elongate and not circular. Scutellum deplanate, subquadrate and not acutely carinate laterally. Abdomen petiolate and strongly compressed from the second segment; basal segment narrow, with its apex strongly dilated and the spiracles beyond its centre. Legs normal; tarsal claws basally pectinate; femora stout and not dentate. Areolet wanting, the submarginal nervure emitted before the recurrent; radial nervure not short and broad.

Range. World-wide.

The species of this distinct genus are known to prey upon Zygænid and Pyralid moths, and in the United States, Ashmead has bred one from a species of *Apatura*; they spin a blackish cocoon within that of their host and closely adherent thereto (*cf.* Bridgman, E. M. M. 1889, p. 185); but the Indian species appear to construct pendulous cocoons, a habit hitherto unobserved in this genus. Walker has described one species, which he doubtfully ascribes to this genus from Japan, under the name *C. luteipes* (Cistula Entom. i, 1874, p. 307); the type is now lost.

Table of Species.

1 (4) Metanotum with carinæ.	
2 (3) Scape and hind femora red; metanotum only basally carinate	*dominans*, Walk., p. 435.
3 (2) Scape and hind femora entirely black; metanotum bicarinate	*obtusus*, sp. n., p. 436.
4 (1) Metanotum with no carinæ or areæ; scape dorsally black	*erythrogaster*, Ashm., [p. 438.

325. Charops dominans, *Walk.*

Porizon dominans, Walker, Ann. Nat. Hist. (3) v, 1860, p. 307 (♂).

♂ ♀. A black species, with the abdomen rufescent and the legs partly flavous. *Head* dull and scabrously punctate throughout,

with white pilosity, strongly transverse, with the emarginate eyes not at all prominent; occiput sloping from the remote ocelli and not emarginate; frons and face deplanate; clypeus not discrete, apically margined and broadly rounded; cheeks as long as the base of the flavous and apically equidentate mandibles; palpi flavous. *Antennæ* with the scrobes circular, carinate and very far apart; flagellum black and filiform, becoming attenuate apically and extending a little beyond the postpetiole; scape and pedicellus clear fulvous, with an external black mark. *Thorax* black, scabrous, with the mesonotum subpunctate and anteriorly abruptly declivous; notauli wanting; metanotum with long hairs, and with very indefinite traces of basal areæ only; petiolar area not impressed; pleuræ subreticulate, with the metapleuræ trans-strigose; spiracles large, elongate and transverse. *Scutellum* broader than long, deplanate, scabrous, pilose, black, with its apex very broad and truncate. *Abdomen* strongly compressed from the second segment, red, with the disc and lateral margin and apex of first, disc of third basally, and the anus, black; basal segment linear and pale fulvous to beyond its apical third and thence very strongly and suborbicularly rounded to apex, longer than second; ♂ cerci exserted, terebra short and hardly longer than third segment. *Legs* bright flavous and not elongate, with all the coxæ, except apices of front ones, black; hind femora clear red, with their tibiæ and tarsi darker; calcaria stout and half the length of the spinulose metatarsus. *Wings* clear hyaline, with the tegulæ pale fulvous, radix flavous, costa and stigma black, with the latter below and the base of the radius red; nervures disposed as in *C. decipiens*, except that the nervellus is not at all geniculate and very obsoletely intercepted far below its centre.

Length 9½ millim.

ASSAM: Margherita (Ind. Mus.); BENGAL: Calcutta, xii. 07 (Ind. Mus.), Chapra (*Mackenzie*), Pusa, x. and xi. 05 (Pusa coll.); CEYLON: Colombo, Mullaitiva and Kandy (*O. S. Wickwar*).

Type in the British Museum.

This is a very representative species of a peculiar genus, but no one could have recognised Walker's species without examining the typical male, which was captured by Dr. Thwaites in Ceylon. A male in the Pusa collection was bred from an ochreous black-spotted cocoon four millimetres in length, which is obviously pendulous, since a thread of many strands, some ten millimetres in length, is still attached to the extremity furthest from that nearly in the centre of which the imago has cut a subcircular emergence hole.

326. Charops obtusus, sp. n.

♂ ♀. A black species, with the legs partly and the abdomen hardly red. *Head* dull and scabrously punctate throughout, with white pilosity, strongly transverse, with the emarginate eyes not at all prominent; occiput sloping from the remote ocelli and not

emarginate; frons and face deplanate; clypeus not discrete, apically margined and broadly rounded; cheeks as long as base of the flavous and apically equidentate mandibles; palpi flavous. *Antennæ* with the scrobes circular, carinate and far apart; black and filiform, becoming hardly attenuate apically, extending barely to the apex of the postpetiole; scape black. *Thorax* immaculate and scabrous, with the mesonotum subpunctate and anteriorly abruptly declivous; notauli very obsolete; metanotum with long hairs and discally bicarinate from base to apex; pleuræ closely reticulate, with the metapleuræ not strigose; spiracles large, elongate and transverse. *Scutellum* broader than long, deplanate, scabrous, pilose, black, with its apex very broadly rounded. *Abdomen* strongly compressed from the second segment, black; in ♀ with the petiole, anus and whole of second to fourth segments extremely dark ferruginous, almost black; in ♂ with segments three to five only laterally red; basal segment linear to beyond its apical third and thence exactly fusiform to apex, longer than second; terebra as long as the second segment, apically subclavate. *Legs* of ♀ pale ochreous and of ♂ stramineous, not elongate, with all the coxæ, except apices of front ones, black; hind legs with the femora and tarsi entirely, tibiæ (except at base), basal joint of trochanters and centre of intermediate femora, black; calcaria stout and three-quarters the length of the metatarsi. *Wings* hyaline, with the tegulæ and radix pale testaceous, the costa and stigma blackish; submarginal nearly as long as the second recurrent nervure, and nearly as far from it; first discoidal cell somewhat narrow and evenly curved above, with its lower external angle subobtuse; basal nervure not continuous; hind wing with only the basal abscissa of the radius present, the median nervure extending to it by means of the first recurrent, and the posterior nervure present as far as the strong nervellus; nervellus subgeniculate slightly below its centre but not intercepted.

Fig. 124.—*Charops obtusus*, Morl.

Length 8½ millim.

Type in the Pusa collection.

United Provinces: Mussoori, 7000 ft., vi. 05 (*E. Brunetti*—Ind. Mus.); Assam: Khasi Hills (Brit. Mus.); Bengal: Calcutta (Ind. Mus.); Bombay: Surat, xi. 03 (Pusa coll., type), Poona (*Capt. Downes*); Madras: Madras (Pusa coll.); Ceylon (*Dr. Thwaites, Col. Yerbury*); Burma: Pegu, viii. 87, and Karen Hills, 3000–3700 ft., vi. 88 (*L. Fea*—Genoa Mus.).

This species is so similar to *C. decipiens* that I have some hesitation in bringing it forward as new; but the abdominal coloration, the very distinctly more gradually constricted apex of

the postpetiole, shorter metathorax, very much shorter metatarsi, and especially the obtuse lower apical angle of the discoidal cell, which in the latter is a little more than rectangular, appear to render it sufficiently distinct.

The type was bred at Surat from its own cocoon, which is six millimetres in length, dull ochreous, with black markings stronger at the extremities, with a pedicle of about four millimetres in length, stout, and weakly woven of many strands, at the end of which it doubtless swung free.

327. **Charops erythrogaster,** *Ashm.*

Charops erythrogaster, Ashmead, Proc. U. S. Nat. Mus. 1896, p. 644 (♂ ♀).

♂ ♀. *Head* strongly transverse, with the vertex acute, black, with fine griseous pubescence; mandibles and palpi whitish; eyes subreniform. *Antennæ* filiform and extending to the second abdominal segment, black, with the scape red beneath and the flagellar joints strongly transverse before the apices. *Thorax* short ovate, dull black, with griseous pubescence and close punctation; notauli somewhat distinct; metanotum apically truncate, with oval spiracles and no carinæ. *Abdomen* double the length of the thorax, compressed, black in ♂, red in ♀; petiole always black, as long as the intermediate femora and less than half the length of the remainder of the abdomen; ventral plica of ♂ alone pale; terebra hardly exserted, with the valvulæ black. *Legs* red, with the posterior (♀) or all (♂) the coxæ black; basal joint of hind trochanters, extreme base of their femora and more or less of their tarsi dark; ♂ with the intermediate legs more or less entirely dark and the hind ones black. *Wings* hyaline, with the nervures piceous, stigma narrow and lanceolate, and tegulæ whitish; third discoidal cell longer than the first; second recurrent emitted from the cubital beyond the submarginal.

Length 6–6·5 millim.

CEYLON: Pundaluoya (*E. E. Green*).

Type. No. 3264 in the United States Museum.

I have not seen this species, which must be quite distinct in its red legs, excarinate metathorax, discally black scape and black ♂ abdomen, from either of the preceding.

A single pair was bred by Mr. Green from the larva of a species of *Eupterote.*

Genus **HYMENOBOSMINA,** *D. T.*

Bosmina, Cameron (*nec* Baird, 1845), Manch. Mem. 1899, p. 120.
Hymenobosmina, Dalla Torre, Cat. Ichn., 1901, p. 136; Schmiedeknecht, Opusc. Ichn. xx, 1908, p. 1523.
Neobosmina, Cameron, Entom. 1906, p. 250.

GENOTYPE, *Bosmina spinipes,* Cam.

Head with the clypeus not discrete: eyes internally roundly, but not deeply, emarginate; mandibular teeth stout and unequal in length. Antennæ as long as the body. Metathoracic areæ

distinct and entire. Scutellum not strongly convex, slightly longer than broad, with its apex obtuse and usually distinctly margined. Basal abdominal segment slender, elongate and carinate beneath, with its spiracles behind the centre; terebra shortly exserted. Tarsal claws with stout and stiff bristles. Wings with no areolet.

Range. India, Ceylon.

In both the typical species of this genus, and in the type of *H. pilosella* the metathoracic spiracles are elongate.

Cameron says (*loc. cit.*) that this genus "comes near to *Charops*, with which it agrees in wanting the areolet, but that genus may be known from it by the eyes being deeply emarginate, the scutellum depressed and the antennæ scarcely half the length of the body. Apart from the absence of the areolet it comes near to *Campoplex*, which may be known from it by the much larger and more elongated spiracles. The spiracles are more oval than in *Limneria*, and the median segment [metathorax] has the areæ more numerous and more distinct." It is very closely allied to *Charops*, but the head is much broader posteriorly.

The above description he supplements in 1903 (Zeits. Hym.-Dipt. iii, p. 338) by a more detailed account of the venation, &c.:—Face and the apically rounded clypeus deplanate; cheeks as long as the scape; postpetiole very distinct from the petiole; basal nervure continuous through the median; hind wings with the apical nervures entirely wanting and with but two entire cells, a longer superior one extending to a little beyond the centre of the wing, and a shorter inferior one less than half the length of the upper.

Table of Species.

1 (4) Frons centrally carinate; scape entirely red.	
2 (3) Flagellum entirely black; legs without black markings	*spinipes*, Cam., p. 439.
3 (2) Flagellum basally pale; hind legs with black markings	*trichoptilus*, Cam., [p. 440.
4 (1) Frons not carinate; scape flavidous only beneath.	
5 (6) Areola not basally acuminate; hind femora black	*pilosella*, Cam., p. 441.
6 (5) Areola basally acuminate; hind femora testaceous	*mandibularis*, Cam., [p. 442.

328. **Hymenobosmina spinipes**, *Cam.*

Bosmina spinipes, Cameron,* Manch. Mem. 1899, p. 121, pl. iii, fig. 13 (♀).

♀. *Head*: face, clypeus and external orbits with dense silvery pubescence; palpi, and base of mandibles broadly, stramineous; vertex closely, the frons more strongly, punctate and centrally carinate. *Antennæ* black, with the pubescence long and pale on the red scape, short and black on the flagellum. *Thorax* immaculate; mesonotum closely punctate, with dense black pilosity;

pleuræ and metathorax with dense silvery hairs; the latter with five clearly defined areæ, besides a small central one at the base; the spiracular region with two complete keels and strongly transversely punctured; propleuræ centrally carinate, mesopleuræ punctate and centrally aciculate, with the metapleuræ more strongly punctate. *Abdomen* red, with the basal segment (except apically) and the basal third of the second, black; terebra very shortly exserted, with the valvulæ black. *Legs* red, with the front coxæ and trochanters flavous; tibiæ and tarsi somewhat strongly spinose; coxæ and femora with white pubescence; spines of claws stout. *Wings* hyaline, with the tegulæ flavous, the nervures and stigma dark.

Length 8 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

329. **Hymenobosmina trichoptilus**, *Cam.*

Hymenobosmina trichoptilus, Cameron, Spolia Zeyl. vi, 1910, p. 40 (♂).

♂. Black, with broad testaceous markings. *Head* finely and closely punctate, the face, clypeus and cheeks with densely pale pubescence; mandibles (except apically) flavous and the palpi paler; frons and vertex sparsely pilose. *Antennæ* 27-jointed and nearly as long as the body; scape fulvo-testaceous; flagellum shortly and densely pubescent, with the five or seven basal joints dull testaceous. *Thorax* with pale pubescence on all the pleuræ and the metathorax; mesonotum closely, and metanotum more sparsely, punctate, the latter with two externally dilated basal areæ, "their keels unite at the base, forming almost an area, widened towards the base"; areola distinct, longer than broad, basally acuminate and apically truncate; petiolar area discrete and centrally trans-striate; metapleuræ finely and closely punctate, carinate below the spiracles and above the hind coxæ. *Scutellum* finely and closely punctate. *Abdomen* with the apex of first, apical third of second, and sides of third to sixth segments, testaceous; petiole smooth and shining, with the postpetiole dilated; second ventral segment flavous, the remainder with testaceous and blackish markings. *Legs* fulvo-testaceous, with the anterior coxæ and trochanters subflavescent; hind coxæ (except apically), apices of their tibiæ and their tarsi, black. *Wings* hyaline, with the stigma dark, the costa and nervures blackish; basal nervure continuous; second recurrent nervure broadly, and the discocubital, fenestrate; hind wing with the apical nervures obsolete.

Length 4 millim.

Ceylon: Galle (*T. Bainbrigge Fletcher*).

Type. Location unknown.

Bred by Mr. Fletcher during December from *Trichoptilus oxydactylus.*

330. **Hymenobosmina pilosella**, *Cam.*

Neobosmina pilosella, Cameron,* Entom. 1906, p. 250 (♂).

♂. A black species, with the legs partly pale. *Head* dull, closely and finely punctate, with dense long silvery pubescence; mandibles (except apically), and palpi, stramineous; frons finely, closely, and irregularly striate in the centre. *Antennæ* with dense short black pubescence; the scape testaceous beneath. *Thorax* with dense long silvery hairs, closely and regularly punctate; metathorax more strongly punctate; areola fully twice as long as broad, truncate, of equal width at both extremities and slightly wider in the middle, finely reticulate, with its base glabrous and the basal carina stronger than the apical; spiracular areæ finely and obliquely striate beyond the spiracles; petiolar area stoutly carinate, longer than broad, more strongly trans-striate, especially in the centre of its broad apex. *Abdomen* black, with the four apical segments laterally, and the apices of the third and fourth broadly above, ferruginous. *Legs* testaceous, with the anterior femora rufescent and their coxæ black; hind legs black, with the tibiæ broadly rufescent centrally beneath and the calcaria dark testaceous. *Wings* with the tegulæ stramineous, stigma and nervures black.

Fig. 125.
Hymenobosmina pilosella, Cam.

Length 8 millim.

The black markings on the legs are variable in extent, and the intermediate legs are somewhat darker than the front ones. This species differs from *H. mandibularis* in having the petiolar area apically broad, the areola not basally acuminate, and the hind femora and tibiæ, except the latter centrally beneath, black.

PUNJAB: Simla, ix. 98 (*Col. Nurse*); BENGAL: Chapra (*Mackenzie*), Pusa, iii. 07 (Pusa coll.); CEYLON: Kandy, ix. 09 (*O. S. Wickwar*).

Type in Col. Nurse's collection.

In addition to the type and cotype, I have seen three other males, differing in no way whatever, except in the possession of a small and elongately petiolate areolet.

331. **Hymenobosmina mandibularis**, *Cam.*

Bosmima mandibularis, Cameron, Zeits. Hym.-Dipt. 1903, p. 338 (♂).

♂. A black species, with the abdomen mainly ferruginous. *Head* with dense silvery pubescence; mandibles (except at apex

and extreme base) and palpi pale flavous; face and clypeus closely and uniformly punctate; frons and vertex nearly as strongly, though less closely, punctate. *Antennæ* as long as the body, black, with the scape centrally flavous beneath. *Thorax* closely and subuniformly punctate; metanotum with dense long silvery pubescence; its basal area short and subtriangular, strongly constricted apically, areola extending to the petiolar area, obliquely constricted basally and gradually contracted to the excarinate apex; propleuræ, centrally and apically, irregularly striate; mesopleuræ finely and closely striate before the glabrous speculum. *Abdomen* ferruginous, with the basal segment and the basal two-thirds of the second, black. *Legs* testaceous, with the anterior flavidous; coxæ, posterior trochanters, base of their femora broadly, hind tarsi and apices of their tibiæ, black. *Wings* hyaline, with the tegulæ pale flavous, the stigma and nervures black.

Length 8 millim.

PUNJAB: Simla; SIKKIM: Darjiling.

This species is said to differ from *H. spinipes* in not having the frons carinate, and in the more sparsely spinulose tibiæ and tarsi; from *H. pilosella* we are told (Entom. 1906, p. 250) that it is distinct in its basally acuminate petiolar area, the basally strongly constricted metanotal areola, and in having the apical half of the hind femora and nearly the whole of their tibiæ red.

Genus **TRATHALA**, *Cam.*

Trathala, Cameron, Manch. Mem. 1899, p. 122.

GENOTYPE, *T. striata*, Cam.

Head not dilated behind the glabrous eyes; clypeus discrete, apically rounded and laterally strongly foveate; mandibles large, with subequal teeth; cheeks distinct. Notauli indicated, but very short; metathorax distinctly areated, with oval spiracles. Scutellum convex, coarsely striolate laterally and apically. Abdomen elongate and compressed, with the spiracles of the basal segment small, circular, and behind the centre; terebra very strongly exserted. Tarsal claws pectinate. Wings short, with no areolet; second recurrent emitted from the external cubital beyond the submarginal nervure; basal nervure continuous through the median.

Range. Assam.

Cameron says this genus is allied to *Campoplex*, but I consider the absence of an areolet places it much closer to *Charops*, Holmg., from which it would appear to differ in little but its discrete clypeus, distinct metanotal areæ, and apparently internally entire eyes. Schmiedeknecht (Opusc. Ichn. p. 1524) places it next to *Nepiesta*, Förster., by adding the supposititious characters:—hind metatarsus more than a third of the tibial length and not dilated, the parallel nervure not interstitial, and the eyes not internally emarginate.

332. **Trathala striata**, *Cam.*

Trathala striata, Cameron,* Manch. Mem. 1899, p. 122, pl. iii, fig. 7 (♀).

♀. An elongate, slender black species, with the greater part of the legs and abdomen red. *Head* with frontal orbits, palpi, mandibles, and the closely punctate face and clypeus, flavous; epistoma above, and the mandibular teeth, black; vertex superficially and sparsely punctate, frons more shining and transversely aciculate. *Antennæ* black, with the scape, except centrally above, flavous. *Thorax* immaculate, closely and strongly punctate; metanotum with two central areæ, the basal being the shorter; its base transverse in the middle, becoming obliquely wider, then gradually narrowed, the keels bounding the narrowed part being slightly curved, not straight like the basal; its apical half transversely striated; the apical area more strongly transversely striated; the basal outer area closely and finely punctate; the apical transversely rugose; the spiracular area distinctly defined, of equal width throughout, and closely transversely rugose; its apex rounded and ending opposite the base of the middle coxæ; behind it is a narrow area, reaching to the hinder coxæ; inside, this area is coarsely rugose (*sec* Cam.); pleuræ strongly punctate, mesopleuræ centrally strigose and basally smooth. *Scutellum* not or hardly more strongly punctate than the mesonotum, with its sides and apex strongly and distinctly striate; postscutellum cariniform. *Abdomen* red, with the first segment entirely, the second discally, and the third basally, black; first segment basally glabrous and beyond the centre isolatedly punctate, finely and closely aciculate laterally above before its apex; second closely and finely aciculate longitudinally throughout to near its smooth apex, and, like the third, which is only basally aciculate, discally impressed; terebra two-thirds the length of the body. *Legs* red, with the anterior coxæ and trochanters flavous. *Wings* hyaline and extending hardly beyond the apex of the second segment; nervures and stigma black; basal and apical abscissæ of the radius oblique, the latter larger and somewhat less straight; second recurrent nervure broadly fenestrate above.

Fig. 126.
Trathala striata, Cam.

Length 15 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

Genus CEPHALOBOLUS, gen. nov.

GENOTYPE, *C. parvipes*, Morl.

Head strongly punctate, nearly cubical, and a little broader than the thorax; mandibles stout, with the lower much longer than the upper tooth, and their base broader than the cheeks; clypeus distinctly discrete, apically very broadly rounded, not reflexed, and distinctly margined; eyes internally parallel and not emarginate, with the head between them and the widely separated scrobes strongly inflated and obtusely prominent; vertex emarginate. Antennæ filiform, stout, and not extending beyond the apex of the abdomen. Thorax nitidulous, deeply and evenly punctate throughout, with obsolete notauli; mesosternum bordered and strongly sinuate apically; metathorax not apically produced, its basal area small and distinct, the petiolar laterally indicated; spiracles elongate oval. Scutellum triangular, slightly convex, and not carinate. Abdomen compressed from base to third segment; the two basal segments of equal length; basal segment parallel-sided to a little beyond its centre and thence elongate fusiform through the spiracles to the constricted apex, glabrous, with very sparse punctation; second closely aciculate throughout; third alutaceous, becoming subaciculate basally; ventral valvulæ large and elongately exserted. Legs short and slender; all the tarsi unusually slender, hind claws nearly straight and obsoletely pectinate basally; anterior coxæ sparsely punctate, the hind ones coarsely and granulately punctate and strongly deplanate beneath. Wings not small, with the nervures very strong; areolet wanting; submarginal nervure but little shorter than the fenestrate second recurrent, and emitted slightly before it; the fenestrate internal cubital continuous with the first recurrent; basal nervure subcontinuous through the median; hind wings with all the apical nervures strongly pellucid; the recurrrent strongly postfurcal and thrice as long as the basal abscissa of the radius; nervellus subgeniculate centrally but not intercepted.

Range. Kashmir.

This genus is certainly closely allied to *Charops* in the wanting areolet, short antennæ, and the structure of the postpetiole, but the head and thorax are much stouter and the legs disproportionately short and slender; to *Clatha* it is allied in the apically obsolete nervures of the hind wings; but from all OPHIONINÆ with which I am acquainted the tumidous frontal orbits, almost exactly resembling those of *Bathycetes* (*Meniscus*) *catenator*, Pz., render it abundantly distinct.

333. Cephalobolus parvipes, sp. n.

♂. A black and nitidulous species, with the legs pale and the abdomen centrally red. *Head* very large and black, with the mandibles internally entirely and externally in the centre, apices

of cheeks, and part of external orbits, red; scrobes broad; face longitudinally impressed on either side and, like the clypeus, strongly and evenly punctate. *Antennæ* and *thorax* black, the latter with the metanotum convex and rugosely punctate. *Abdomen* black and subpubescent, with the third and apex of second segment red, the three or four basal ventral segments and apices of the genital valvulæ pale testaceous. *Legs* weak and fulvidous, with all the coxæ and trochanters (except apically) black; hind femora centrally and their tibiæ apically dark beneath, their calcaria hardly longer than the apical breadth of the closely spinulose tibiæ. *Wings* subhyaline, with the radix and base of costa flavidous in all the wings, the tegulæ dark and the stigma blackish, with its base paler.

Fig. 127.
Cephalobolus parvipes, Morl.

Length 10 millim.

KASHMIR, 5000–6000 ft., v. 01 (*Col. Nurse*).

Type in Col. Nurse's collection.

Genus **XANTHOCAMPOPLEX**, gen. nov.

GENOTYPE, *X. orientalis*, Morl.

It is convenient, if not entirely natural, to place the following very remarkable insect in a genus apart from *Campoplex*, on account primarily of the peculiar conformation of the alar areolet and the tibial spines; but the divergence from that genus is so small, though the facies is very distinct, that it is only necessary to say that the present genus differs therefrom in having the clypeus somewhat distinctly discrete; the third abdominal segment not at all laterally margined; the scutellum subglabrous; the tibial spines strongly elongate; the nervellus straight throughout, not geniculate, intercepted, or curved; the apical abscissa of the radius in the front wings straight, and the areolet minute, oblique, and subobsolete, being less than half the length of its petiole. Colour mainly flavous.

Range. Sikkim.

This genus appears to bear much the relationship to *Campoplex* that *Xanthopimpla* does to *Pimpla*.

334. **Xanthocampoplex orientalis**, sp. n.

♂ ♀. *Head* very strongly transverse and posteriorly obliquely constricted behind the internally emarginate and prominent eyes; frons deplanate and broadly impressed above the normal scrobes;

vertex very narrow and centrally emarginate, with the ocelli approximate; face transverse and nitidulous, strongly and evenly punctate, with the epistoma a little elevated; clypeus subconvex, apically margined, and broadly rounded, laterally foveate; mandibles stout and apically equidentate, basally punctate and broader than the cheeks. *Antennæ* stout and filiform, with the basal flagellar joints not discrete. *Thorax* dull, evenly and distinctly punctate, with no notauli; metanotum not elongate, with no basal areæ, but with the apices of the costulæ and sides of the excavate and trans-aciculate petiolar area somewhat strong; spiracles linear. *Scutellum* nitidulous and sparsely though distinctly punctate, convex and laterally striate. *Abdomen* strongly compressed throughout and obsoletely punctate; basal segment linear to a little beyond its centre, and thence abruptly and exactly fusiform to apex; second a little longer than the faintly trans-impressed third; anus of ♂ abruptly truncate, with the valvulæ not exserted, of ♀ strongly obtuse, with the terebra shorter than the basal segment. *Legs* of normal length; hind tibiæ with strong and elongate discal spines throughout: claws closely pectinate. *Wings* hyaline, with the nervures and narrow stigma black; radial cell narrow and hardly angled above the minute areolet, which is oblique and occupies hardly the lower external third of the submarginal nervure; basal nervure not quite continuous; lower wing with the basal abscissa of the radius as long as the second recurrent; nervellus straight and simple.

Fig. 128.
Xanthocampoplex orientalis, Morl.

Length 8–10 millim.

Sikkim, iv. 91 and iv.–vi. 00 (*Col. Bingham*).

Type in the British Museum.

This is a bright flavous species with the mandibular apices, interocellar space contiguous with occiput below, flagellum, three mesonotal vittæ (the external ones confluent at the scutellar fovea), two basal metanotal spots, variable small meso- and sometimes meta-pleural marks, discal and lateral and ventral apices of abdominal segments, and the hind legs with coxal and trochanteral spots, base and apex of tibiæ, external lines on femora and most of their tarsi, black.

I have seen three specimens, representing both sexes, of this species.

Genus CAMPOPLEX, *Grav.*

Campoplex, Gravenhorst, Ichn. Europ. iii, 1829, p. 453; Förster, Verh. z.-b. Ges. 1868, p. 761.

GENOTYPE, *Ichneumon pugillator*, L.

Head nearly always distinctly transverse, rarely subcubical; eyes internally emarginate next the scrobes; clypeus laterally foveate, and not discrete from the closely punctate and subdeplanate face; mandibles broad, with equal teeth. Antennæ subfiliform, not longer than the body, and always somewhat stout; scape subentire. Thorax always coarsely sculptured discally, scabrous or rugulose; metathorax elongate and not apically produced; metanotum usually impressed longitudinally in the centre, rarely carinate, with more or less obsolete areæ; spiracles always elongate and often linear. Scutellum coarsely sculptured and not deplanate. Abdomen strongly compressed throughout and usually centrally red; first segment not plicate beyond the centre of the postpetiole; the two basal segments narrow, with their spiracles beyond, very rarely in, their centre; third at least basally margined; terebra very rarely elongate. Legs slender, with the hind femora usually a little stouter; tibiæ obsoletely spinulose; tarsi not dilated, and their claws always more or less closely pectinate; calcaria stout, with the front ones sinuate. Areolet large, broad, always triangular and distinct, often petiolate and never broadly sessile; stigma narrow; radial cell not broad, with the external radius usually bisinuate; lower wing with the basal abscissa of the radius and the recurrent nervure strong and of variable relative length; nervellus usually geniculate or intercepted below, rarely in, its centre, but sometimes simply a little curved at its lower extremity.

Range. Palæarctic and Nearctic Regions, India, Ceylon.

With us this genus, easily recognised by its elongate metathoracic spiracles and large triangular areolet, is almost confined to the hill districts, and the very great majority are only known from the Himalayas; the mountains of Ceylon have five species, and both Poona and Calcutta but one. I regret that my knowledge of the European representatives is insufficient to enable me to clear up all the synonymy; but I have little hesitation in saying that most of at least the northern forms may prove to be widespread Palæarctic species; but it is better to allow Cameron's names to stand provisionally until a more exhaustive comparison with the European forms is possible. Cameron's descriptions are somewhat superficial, and omit many of the more important characters utilised by Holmgren and Förster to such an extent that I cannot place his *C. speciosus*, the type of which I have had no opportunity of examining.

Table of Species.

1	(32)	Areolet more or less distinctly petiolate.	
2	(31)	Wings clear hyaline throughout.	
3	(28)	Mandibles apically or entirely black.	
4	(15)	Second recurrent nervure emitted at or before centre of areolet.	
5	(12)	Areolet very shortly petiolate.	
6	(9)	Metanotum discally impressed; second abdominal segment apically red.	
7	(8)	Hind tibiæ testaceous; scape black ..	*proximus*, Först., p. 449.
8	(7)	Hind tibiæ black; scape pale at apex	*fuscipalpis*, Cam., [p. 450.
9	(6)	Metanotum not discally impressed; second abdominal segment usually all black.	
10	(11)	Anus black; basal nervure elongately postfurcal	*novitius*, sp. n., p. 450.
11	(10)	Anus red; basal nervure slightly postfurcal	*perditor*, Först., p. 451.
12	(5)	Areolet with a long petiole.	
13	(14)	Inner submarginal nervure thrice the length of its petiole	*indicus*, sp. n., p. 452.
14	(13)	Inner submarginal nervure hardly longer than its petiole	*simlaensis*, Cam., p. 453.
15	(4)	Second recurrent emitted beyond centre of areolet.	
16	(25)	Hind tibiæ black, sometimes paler apically or at the base.	
17	(20)	Frons sparsely punctate and centrally carinate.	
18	(19)	Metanotum impressed throughout; hind tibiæ basally white	*minimus*, sp. n., p. 453.
19	(18)	Metanotum centrally impressed; hind tibiæ basally black	*cytæis*, Cam., p. 454.
20	(17)	Frons closely punctate and not carinate.	
21	(22)	Areolet incomplete: metanotal areæ entire	*inquinatus*, sp. n., p. 454.
22	(21)	Areolet complete; metanotal areæ not entire.	
23	(24)	Metanotum not centrally carinate; basal nervure not continuous	*zonatus*, sp. n., p. 455.
24	(23)	Metanotum centrally bicarinate; basal nervure continuous	*binghami*, sp. n., p. 456.
25	(16)	Hind tibiæ red, with their apices alone black.	
26	(27)	Petiole of areolet very short; metanotum centrally bicarinate	*altius*, sp. n., p. 456.
27	(26)	Petiole of areolet elongate; metanotum not centrally carinate	*tyrannus*, Cam., p. 457.
28	(3)	Mandibles entirely pale.	
29	(30)	Front coxæ and anus black	*lapponicus*, Holmg., [p. 458.
30	(29)	Front coxæ pale, anus entirely red ..	*prytanes*. Cam., p. 458.
31	(2)	Wings infumate, becoming violaceous apically	*infumatus*, n. n., p. 459.

32 (1)	Areolet with no distinct petiole.	[p. 460.
33 (34)	Wings very strongly infumate	*himalayensis*, Cam.,
34 (33)	Wings clear hyaline throughout.	
35 (40)	Second recurrent emitted from centre of areolet.	
36 (37)	Hind tibiæ flavescent; anus entirely red	*confusus*, Först., p. 461.
37 (36)	Hind tibiæ and the anus black.	
38 (39)	Length 12 millim. ♀ only	*buddha*, Cam., p. 462.
39 (38)	Length 10 millim. ♂ only	*indicatus*, sp. n., p. 463.
40 (35)	Second recurrent emitted beyond centre of areolet.	
41 (42)	Areolet vertical; legs nearly entirely	[p. 463.
	black	*reticulatus*, sp. n.,
42 (41)	Areolet oblique; legs mainly red.	[p. 464.
43 (44)	Scutellum and head not white	*sumptuosus*, Cam.,
44 (43)	Scutellum and part of head broadly white	*longipes*, Smith, p. 464.

335. Campoplex proximus, *Först.*

Campoplex proximus, Förster, Verh. z.-b. Ges. 1868, p. 868.

♂. A black species, with the abdomen centrally red and the tibiæ testaceous. *Head* distinctly transverse, with the frons rugosely punctate and feebly carinate centrally; mandibles, except apically, and the palpi, testaceous. *Antennæ* elongate, immaculate, with the ten penultimate joints longer than broad. *Thorax* black; propleuræ coarsely but not closely trans-rugose below; mesopleuræ alutaceous and dull; metathorax longitudinally impressed throughout and basally trans-rugose, with inconspicuous basal carinæ. *Abdomen* black, with the third, most of fourth, and apex of the second segments red, the third with a lateral black line to the spiracles; basal segment with no lateral foveæ and its spiracles somewhat prominent, broadest between the spiracles and thence gradually constricted to the apex. *Legs* testaceous, with the base of the anterior coxæ, the hind coxæ, their trochanters and femora, black; hind tibiæ darkened apically and slightly at their extreme base. *Wings* hyaline, with the areolet slightly petiolate, emitting the recurrent nervure from its centre; tegulæ testaceous; stigma piceous.

Length 8–9 millim.

United Provinces: Mussoori, v. 05 (*E. Brunetti*—Ind. Mus.).

This species has been found extremely rarely, and has not been recorded since Förster took it at Aachen, more than forty years ago. Yet there is an undoubtedly synonymous ♂ in the Calcutta Museum; and with it was taken a specimen agreeing with the doubtfully distinct *Campoplex anxius*, Först., also known only from Aachen and in the male sex; it agrees in every way with *C. proximus* except in its strongly petiolate areolet; the size, however, is slightly larger, and the abdomen, unfortunately, is wanting.

336. Campoplex fuscipalpis, *Cam.*

Campoplex fuscipalpis, Cameron,* Manch. Mem. 1899, p. 115 (♀).

♀. *Head* black, with only centre of mandibles piceous; palpi dark and with black pubescence; face and clypeus closely and uniformly though not finely punctate, and with sparse silvery pubescence; frons and vertex similarly punctate, with shorter dark pubescence. *Antennæ* black and with very short black pubescence; scape with somewhat long white pubescence beneath, and apically testaceous. *Thorax* immaculate and discally punctate; mesonotum with dense dark hairs; metanotum with somewhat sparse silvery pubescence, especially centrally, the base from the middle to the apex broadly depressed; propleuræ closely punctate and below longitudinally aciculate; mesopleuræ below basally nitidulous and obsoletely striate, their apices above distinctly aciculate nearly to centre; metapleuræ closely punctate to spiracles and thence closely and irregularly aciculate. *Scutellum* with dense pale pilosity. *Abdomen* black, with the sides broadly and the apex of second and third segments entirely, and of fourth segment except discally, red. *Legs* black; anterior femora apically throughout and beneath to centre, and the front tibiæ and tarsi entirely, testaceous. *Wings* clear hyaline; costa and stigma black, nervures paler; areolet very shortly petiolate, with its sides coalescent above, emitting the recurrent nervure almost from its centre; first submarginal nervure straight, the second slightly curved.

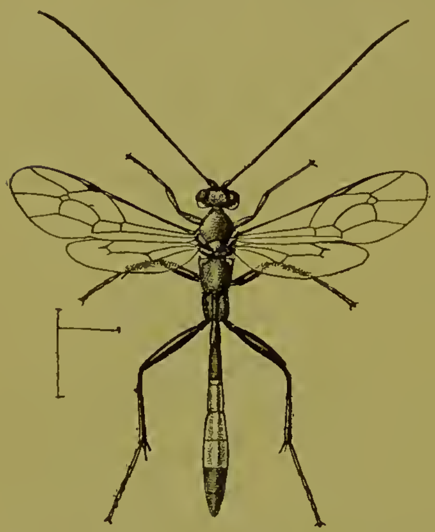

Fig. 129.—*Campoplex fuscipalpis,* Cam.

Length 8 millim.

This species, which is indicated as a female though no mention is made of the concealed terebra, was collected by Rothney in the Khasi Hills of Assam.

Type in the Oxford Museum.

337. Campoplex novitius, sp. n.

♂. A black species, with long pilosity; the mandibles and front legs partly testaceous, and the abdomen centrally red. *Head*

closely punctate and not very narrow posteriorly; frons simple, and the scrobes a little elevated externally; mandibles, except at apex, testaceous and basally as broad as the cheeks; palpi black. *Antennæ* immaculate, with the basal flagellar joints not discrete. *Thorax* with the metanotum finely scabrous and not at all impressed, with no trace of carinæ; spiracles elongate. *Scutellum* coarsely punctate, and not carinate. *Abdomen* obsoletely punctate, black, with the third, fourth, and base of the fifth segments bright red; postpetiole linear and hardly broader than the petiole, valvulæ large and exserted. *Legs* black, somewhat slender, with only the front coxæ apically, their femora and tibiæ internally, testaceous. *Wings* hyaline, with the tegulæ and stigma black; areolet vertical, somewhat broad, with its petiole hardly a fourth the length of the internal nervure, external nervure straight, emitting the recurrent nervure from distinctly before its centre: radius externally sinuate, lower basal nervure elongately postfurcal; lower wings with basal abscissa of radius half as long again as recurrent; nervellus neither geniculate nor intercepted, but slightly curved below.

Length 9 millim.

United Provinces: Mussoori, 7000 ft., x.06 (*H. M. Lefroy*). *Type* in the Pusa collection.

In size and coloration it closely resembles *C. zonatus*, but the conformation of the areolet, etc., is very distinct. Its facies closely resembles that of *C. lapponicus*, Holmg.

338. Campoplex perditor, *Först.*

Campoplex perditor, Förster, Verh. z.-b. Ges. 1868, p. 796; Kriechbaumer, Corr. Zool. Min. Ver. Reg. 1883, p. 113; Thomson, Opusc. Ent. xi, 1892, p. 1077 (♀).

♀. *Head* black and narrowed posteriorly, with the mandibles (except apically) and palpi pale; frons distinctly carinate and not impressed centrally; scrobes simple. *Antennæ* black and nearly as long as the body. *Thorax* immaculate, with piceous pilosity; pronotum trans-striate beneath; mesopleuræ strongly punctate and somewhat nitidulous. *Scutellum* distinctly convex. *Abdomen* strongly compressed, red, with the basal segment, second (except its apex), the third discally and sometimes the following discally, black; basal segment elongate, with weak lateral foveæ and prominent spiracles; third segment laterally emarginate; terebra shortly exserted. *Legs* testaceous, with the anterior basally, the hind coxæ, trochanters and femora, with apex and extreme base of their tibiæ, black. *Wings* hyaline, with the tegulæ blackish and the stigma dull ferruginous; areolet subpetiolate, emitting the recurrent nervure from its centre; basal nervure slightly postfurcal.

Length 9 millim.

Bombay: Poona, viii. 86 (*R. C. Wroughton*—Brit. Mus.). Germany.

The normal length of this species in Germany is 13–14 millim., but the specimen taken at Poona by my friend Mr. Wroughton so exactly coincides with it in every other respect that I do not feel justified in regarding it as distinct. In this example the anus is entirely rufescent and the third segment has no lateral black lines.

339. **Campoplex indicus**, sp. n.

Campoplex indicus, Cameron MS.

♀. A dull black species, with only the abdomen and front legs partly red. *Head* closely and rugulosely punctate, and roundly constricted behind the eyes; face distinctly and somewhat deeply punctate; cheeks as broad as the base of the immaculate mandibles. *Antennæ* immaculate, with the basal flagellar joints not discrete. *Thorax*: metanotum somewhat evenly scabriculous, with no trace of areæ, centrally subsulcate and trans-aciculate from near base to apex; spiracles linear. *Scutellum* black, dull, and a little convex. *Abdomen* discally linear, obsoletely punctate and compressed from base of third segment; basal segment glabrous and hardly broader beyond the subcentral spiracles; second segment pilose, with distinct thyridii, its apex somewhat broadly and the two following segments entirely bright red; terebra straight, slightly longer than the basal segment. *Legs* normal, black, with the front tibiæ and inner side of their femora alone red; intermediate tibiæ dusky ferruginous; inner hind calcar slightly longer than the outer. *Wings* clear hyaline, with the tegulæ and stigma black; areolet oblique, distinctly petiolate, with the petiole about one-third the length of the internal submarginal nervure; external submarginal broadly curved; radius slightly sinuate above the areolet, which emits the recurrent from its centre; lower basal nervure elongately postfurcal; lower wings with basal abscissa of radius nearly twice as long as the recurrent nervure and the nervellus subgeniculate, though not intercepted, at its lower third.

Length 11 millim.

Punjab: Simla, iv. 97 (*Col. Nurse*, type); Rajputana: Mt. Abu (*Col. Nurse*).

Type in Col. Nurse's collection.

This species is apparently allied to *C. stragifex*, Först., but with the frons not carinate, intermediate femora black and the third abdominal segment immaculate laterally, speculum not smoother, second segment shorter than third, and the legs much darker.

Possibly my *C. indicatus* is the male of the present species, though I think not.

340. **Campoplex simlaensis**, *Cam.*

Campoplex simlaensis, Cameron, Zeits. Hym.-Dipt. v, 1905, p. 282 (♀).

♀. Black, with the abdomen broadly red centrally and the anterior legs mainly flavous. *Head* black and with silvery pubescence throughout; face and clypeus closely, uniformly and somewhat strongly, the frons and nude vertex more feebly, punctate; mandibles immaculate and with white pubescence. *Antennæ* black. *Thorax*: metanotum closely and uniformly punctate, with dense white hairs and longitudinally canaliculate from near base; basal lateral areæ entire and broadly rounded; propleuræ glabrous and nitidulous below, closely and distinctly punctate above; mesopleuræ closely punctate, subimpressed and longitudinally aciculate centrally, and obliquely substriate on their upper two-thirds; metapleuræ closely and somewhat strongly punctate, obscurely striate above. *Scutellum* closely and rugosely punctate, with dense long white pubescence. *Abdomen* black, with the third to fifth segments, and the second beneath, red. *Legs* black, with the anterior tibiæ and tarsi pale flavous, their femora ferruginous; hind calcaria black. *Wings* clear hyaline, shorter than the abdomen, with the stigma and nervures black; areolet rounded above, with the petiole nearly as long as the sides of the areolet, emitting the recurrent nervure from its centre; basal nervure not continuous through the median; hind wings with the external nervures subobsolete.

Length 10 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

341. **Campoplex minimus**, sp. n.

♂ ♀. *Head* distinctly transverse and black, with the mandibles black and the palpi stramineous; frons centrally carinate longitudinally, but not impressed; scrobes simple. *Antennæ* black and nearly as long as the body. *Thorax* immaculate, with white pubescence; metathorax longitudinally impressed throughout and trans-aciculate; spiracles linear. *Scutellum* convex and black. *Abdomen* with the third, fourth, and extreme apex of the second segment red; postpetiole immaculate black and discally convex beyond the conspicuous spiracles; third segment laterally immarginate and immaculate; terebra very shortly exserted. *Legs* black, with the anterior tibiæ and tarsi, and the fulvous front femora internally, stramineous; hind tibiæ conspicuously white at their base. *Wings* hyaline, with the tegulæ dark, the radix stramineous and the stigma ferruginous; areolet somewhat elongately petiolate, emitting the recurrent nervure distinctly beyond its centre; lower basal nervure but slightly further from

base than the upper; basal abscissa of radial nervure in hind wing hardly longer than the recurrent; nervellus indistinctly intercepted far below its centre.

Length 7 millim.

BENGAL: Calcutta, xii. 07 (Ind. Mus.); ASSAM: Shillong, 6000 ft. (*Rowland Turner*).

Type ♀ in the Indian Museum.

This species is certainly most closely allied to *C. perditor*, Först., from which its smaller size and basally white hind tibiæ will distinguish it.

The ♂ from Shillong probably constitutes the alternate sex, since it differs only in its stramineous mandibles and tegulæ, and the entirely rufescent anus.

342. **Campoplex cytæis**, *Cam.*

Campoplex cytæis, Cameron, Zeits. Hym.-Dipt. iii, 1903, p. 339 (♀).

♀. A black species, with the abdomen narrowly in the centre, and the anterior legs more broadly, red. *Head* black, closely punctate, the face and clypeus with dense white pubescence; palpi infuscate, and the mandibles centrally broadly red; frons sparsely and superficially punctate, centrally distinctly carinate. *Antennæ* immaculate. *Thorax* black; metanotum broadly but superficially impressed centrally, more strongly punctate than the mesonotum and closely trans-striate, but more sparcely so apically; basal area small and quadrate, emitting short oblique carinæ from its apical angles; propleuræ nitidulous and irregularly striate below; metapleuræ apically strongly and obliquely striate above the unusually stout lateral carinæ; metasternal carinæ stout and distinct. *Scutellum* convex and with sparse pale pubescence, obscurely striate laterally. *Abdomen* black, with the third segment almost entirely, and the second laterally, red. *Legs* with the anterior tibiæ and the apices of their femora dull testaceous; hind legs black, with the apices of the tibiæ dull testaceous. *Wings* hyaline and iridescent, with the stigma and nervures blackish; areolet shortly petiolate, emitting the recurrent nervure beyond its centre.

Length 14 millim.

SIKKIM: Darjiling.

343. **Campoplex inquinatus**, sp. n.

♀. A small and slender black species, with obscure red markings on the abdomen and anterior legs. *Head* constricted behind the eyes and distinctly transverse; frons neither carinate nor impressed; scrobes simple. *Antennæ* black throughout and three-quarters the length of the body. *Thorax* immaculate; metanotum

trans-strigose, with the areæ entire and strong; areola hexagonal and elongate, emitting costulæ slightly before its centre; petiolar area strongly discrete; spiracles elongate. *Abdomen* black, with the third and fourth segments, apex of fifth narrowly, and lateral spots on the second, red; postpetiole immaculate and but slightly dilated apically; terebra very shortly exserted. *Legs* slender and black, with the anterior tibiæ, the front femora (except basally above), and the intermediate slightly, testaceous. *Wings* hyaline, with the stigma and tegulæ entirely black, radix testaceous; basal nervure not continuous; areolet distinctly petiolate and emitting the unifenestrate recurrent nervure very slightly before its basally pellucid external nervure; basal abscissa of the radius in the hind wings hardly at all longer than the recurrent nervure; nervellus subgeniculate, though not intercepted, far below its centre.

Fig. 130*a*
Campoplex inguinalis, Morl.

Length 11 millim.

ASSAM: Shillong, 6000 ft., viii. 03 (*Rowland Turner*).

Type in the British Museum.

Similar to *C. incompletus*, Bridg., only known from Britain and in the male sex; but very different in its metanotal sculpture.

344. **Campoplex zonatus**, sp. n.

Campoplex zonatum, Cameron MS.

♀. *Head* distinctly transverse and roundly constricted behind the eyes; frons finely and closely punctate, very obsoletely carinate above the simple scrobes; mandibles black, becoming badious before their apices, and basally as broad as the cheeks; palpi dark and ligula testaceous. *Antennæ* immaculate. *Thorax*: metathorax with no carinæ, centrally subsulcate and trans-striate throughout; spiracles elongate. *Abdomen* obsoletely punctate and black, with the third and fourth segments alone bright red; postpetiole immaculate, linear and hardly broader than the petiole; terebra very short, reflexed and hardly extending beyond the anus. *Legs* black, with the calcaria, and front tibiæ and tarsi, testaceous; hind femora not very slender. *Wings* hyaline, with the tegulæ and stigma dark; areolet vertical, with the inner nervure thrice as long as its petiole, the outer nervure slightly curved, emitting the recurrent nervure a little beyond its centre; radius not sinuate above the areolet; basal nervure not continuous; basal abscissa of the radius of the hind wing only slightly longer than

the recurrent nervure; nervellus geniculate, though not intercepted, at its lower third.

Length 10 millim.

It would appear to be somewhat closely allied to *C. spinipes*, Thoms., which I do not know.

PUNJAB: Simla, ix. 98 (*Col. Nurse*, type), Kangra Valley, 4500 ft., vii. 99 (*G. C. Dudgeon*).

Type in Col. Nurse's collection.

345. **Campoplex binghami**, sp. n.

Campoplex binghami, Cameron MS.

♀. *Head* transverse and posteriorly a little narrower than the eyes, but not roundly constricted: frons with no carina, not impressed, and scrobes not auriculate; palpi and mandibles except apices of latter, stramineous. *Antennæ* black, with the scape stramineous beneath, and basal flagellar joints not discrete. *Thorax* with the mesopleuræ nitidulous, and the interstices smooth; metanotum centrally trans-striate and distinctly bicarinate throughout, with the costulæ strong and the petiolar area a little impressed; spiracles linear. *Abdomen* obsoletely punctate, black, with the apical half of third, whole of fourth, most of fifth, and apices of the remaining segments, red; postpetiole immaculate and laterally a little curved; third segment only basally margined; terebra half the length of the abdomen and very slightly reflexed. *Legs* black, with the hind femora not slender; calcaria, anterior tibiæ, and front femora internally, testaceous. *Wings* hyaline, with the tegulæ and stigma black; areolet with the inner submarginal nervure not longer than its petiole, the outer curved, and the recurrent emitted almost from its apex; basal nervure continuous; basal abscissa of radius of hind wing not longer than the recurrent nervure; nervellus geniculate, though not intercepted, at its lower third.

Length 12 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species appears to be allied to *C. punctatus* and *C. incompletus*, Bridg., though certainly very different from either.

346. **Campoplex altius**, sp. n.

♂. A black species, with long white pubescence: the mouth, scape, and legs flavidous, the apical half of the abdomen red, and the metanotum strongly bicarinate throughout.

Length 10 millim.

This species is extremely like *C. binghami* and may possibly constitute its alternate sex; but it differs in having the petiole of the areolet hardly a third the length of the inner submarginal nervure, the head much narrower behind the eyes, the frons obsoletely carinate longitudinally in the centre, the scape entirely

bright flavous with only its apex black above, the anterior legs with their hind trochanters flavous, the tegulæ also flavous, the hind legs fulvous with only their coxæ black, the nervellus not at all geniculate, the anus entirely red, and the red genital valvulæ exserted.

Ceylon: Diyatalawa, 4000 ft., viii. 07 (*T. B. Fletcher*).

Type in the author's collection.

Described from a single specimen.

347. **Campoplex tyrannus**, *Cam.*

Campoplex tyrannus, Cameron, Manch. Mem. 1899, p. 116 (♂).

♂. *Head* black; face and clypeus closely, uniformly, and somewhat coarsely punctate, with dense dark pilosity; epistoma closely trans-aciculate above; mandibular teeth testaceous, palpi flavous. *Antennæ* entirely black, with short black pubescence; scape with dense long black pubescence beneath. *Thorax* immaculate; mesonotum closely punctate, with dense dark pubescence; metanotum with dense long silvery hairs, closely trans-aciculate and centrally canaliculate; propleuræ nitidulous, aciculate above, apically sulcate and carinate; mesopleuræ strongly punctate, with silvery hairs, strongly striolate below the radices, basally sulcate throughout, with the oblique impression strongly subtransversely striolate, and the apex longitudinally aciculate; metapleuræ finely rugose, centrally carinate, with the carina abruptly curved basally before the spiracles. *Scutellum* coarsely rugose, with long pale pilosity, and laterally excavate and glabrous. *Abdomen* red, with the basal segment entirely, the second discally, and the fourth to anus broadly tinged with, black. *Legs* testaceous; coxæ, posterior trochanters, and hind femora black; front legs flavidous and intermediate femora rufescent; hind tibiæ red and densely spinose, with their apices and tarsi black. *Wings* clear hyaline; nervures and stigma dark; areolet petiolate with its sides curved, emitting the recurrent nervure from its apical third.

Length 9 millim.

♀. Agreeing in every way with the above description, except that the two basal segments and the basal half of the third are black, with the anus entirely red, the intermediate femora also black, and the distinctively spinulose hind tibiæ bear a dark band before their pale base. The areolet is strongly oblique, with its inner nervure almost shorter than its petiole; the radius externally straight, and the basal nervure not quite continuous; the radius of hind wings about a third longer than the recurrent, and the nervellus quite straight. The metathoracic spiracles are linear, and the terebra extends but slightly beyond the apex of the abdomen.

Length 12 millim.

Assam: Khasi Hills (*Rothney*, type); Ceylon: Maskeliya, iv. 05 (*E. E. Green*).

348. **Campoplex lapponicus**, *Holmg.* (Plate I, fig. 9.)

Campoplex lapponicus, Holmgren, Sv. Ak. Handl. 1858, p. 37; Förster, Verh. z.-b. Ges. 1868, p. 872; Holmgren, Bih. Sv. V.-A. Handl. 1872, p. 51; *cf.* Thomson, Opusc. Ent. xi, p. 1073, *et* Brischke, Schr. Nat. Ges. Danz. 1891, p. 65 (♂ ♀).
Campoplex callizonus, Förster, Verh. z.-b. Ges. 1868, p. 803 (♀).
Campoplex greeni, Cameron, Spolia Zeylanica, 1905, p. 127 (♀).

♂ ♀. A black species, with the centre of the abdomen and part of the legs rufescent. *Head* very little constricted posteriorly, closely punctate and with dense silvery pubescence; frons not impressed, scrobes simple; mandibles ferruginous throughout, and basally with white pubescence; palpi dark testaceous. *Antennæ* immaculate. *Thorax* distinctly and closely punctate, with dense silvery pubescence; on the base of the metanotum are two roundly curved keels, forming two areæ, which are as long as wide; the centre is depressed and transversely striated closely above, more widely and broadly below; pleuræ less closely punctate than mesonotum, propleuræ sinuately and obliquely striate centrally and below, central apical impression of mesopleuræ closely and regularly striate. *Abdomen* black, with the third to fifth segments alone bright red; terebra exserted. *Legs* black, with the front tarsi, tibiæ, and apices of their femora, testaceous; intermediate femora near apices, and often their tibiæ more broadly basally, testaceous; calcaria concolorous. *Wings* hyaline, with the stigma infuscate and the nervures black; areolet triangular and shortly petiolate, emitting the recurrent nervure before its centre; nervellus geniculate below its centre; basal abscissa of radius half as long again as the recurrent nervure.

Length 9–12 millim.

N.W. Frontier Province: Peshawur (*Capt. E. Y. Watson*); Punjab: Simla and Kasauli, v. 08 (*N. Annandale*); United Provinces: Mussoori, vi. 04 (*E. Brunetti*—Ind. Mus.); Sikkim: Darjiling, x. 05 (*E. Brunetti*—Ind. Mus.); Ceylon: Pundaluoya and Hatton, ii. (*E. E. Green*).

Type in the Stockholm Museum.

Bridgman (Trans. Ent. Soc. 1889, p. 420) records this species as having been bred in England from the Geometrid moth, *Melanippe hastata*; he describes its cocoons as "palish brown, sometimes ashy and uniform in tint"; and remarks upon the distinctness of the species, the terebra of which is about as long as the basal segment. I possess one of his bred specimens.

349. **Campoplex prytanes**, *Cam.*

Campoplex prytanes, Cameron, Zeits. Hym.-Dipt. iii, 1903, p. 339 (♀).

♀. *Head* black, with the mandibles (except basally) and the palpi testaceous; face closely, and the clypeus a little more

sparsely, punctate. *Antennæ* longer than the body and entirely black. *Thorax* closely punctate and immaculate; metanotum more closely rugosely punctate and with more dense white pubescence than the mesonotum, with an apical oblique carina on either side extending to the metapleural carinæ; propleuræ nitidulous and centrally finely striate. *Abdomen* red, with the basal segment alone black. *Legs* black, with the tibiæ and tarsi feebly spinulose; front legs flavidous testaceous; intermediate tarsi, tibiæ, and apices of femora, testaceous; hind tarsi black, with their tibiæ testaceous red, becoming apically dark. *Wings* hyaline, with the stigma and nervures black; areolet shortly petiolate.

Length 10 millim.

SIKKIM: Darjiling.

350. **Campoplex infumatus**, nom. nov.

Campoplex carinifrons, Cameron* (*nec* Holmg.), Manch. Mem. 1899, p. 119 (♂).

♂. *Head* black, with the vertex closely punctate and with dense black pubescence, with a distinct external sulcus by the basal ocelli, which are separated by a longitudinal sulcus; frons depressed, with a stout longitudinal central carina; apex of clypeus isolatedly punctate; mandibles and palpi testaceous; face densely pale-pilose. *Antennæ* entirely black and very shortly pubescent; scape punctate with longer black pilosity. *Thorax* immaculate; mesonotum closely and uniformly punctate, with its central lobe subelevated; carina of metathorax curved laterally; at the middle it does not join the base of the segment, being separated by a small smooth square area; the part of the sides enclosed by it closely punctate, the punctures more minute at the base, running at the apex into obscure reticulations; the apex of the segment broadly depressed in the middle, and strongly transversely striated; propleuræ closely punctate above and strongly striate below; mesopleuræ strongly punctate, very finely and closely aciculate below the tubercles, more strongly and irregularly at the base of the foveæ. *Scutellum* elevated, pyramidal and with dense black pubescence, its basal fovea deeply impressed; postscutellum rugosely punctate. *Abdomen* red, with the three basal segments discally broadly, and the following narrowly, black. *Legs* testaceous; coxæ and posterior trochanters, and the hind femora basally, black; hind tarsi blackish. *Wings* infumate, becoming violaceous apically; areolet constricted and almost petiolate above, emitting the recurrent nervure shortly beyond its centre.

Length 14–15 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

This male is said by its author to be similar in coloration to *C. himalayensis*, though differing in its smaller size, distinctly

carinate frons, more strongly pyramidal scutellum, with its basal fovea broader and more profound; the propleuræ being much more strongly and regularly striolate below on either side of the foveæ; the areolet shortly but distinctly petiolate (*cf. supra*), and the basal segment only discally black.

351. **Campoplex himalayensis**, *Cam.*

Campoplex himalayensis, Cameron,* Manch. Mem. 1899, p. 117 (♂).

♂. *Head* with an interocellar sulcus, the frons and vertex isolatedly punctate and with dense black pubescence; face and clypeus, except apically, strongly punctate; mandibles coarsely punctate, and dull testaceous before their teeth; palpi fulvo-testaceous. *Antennæ* entirely black, with dense and very short

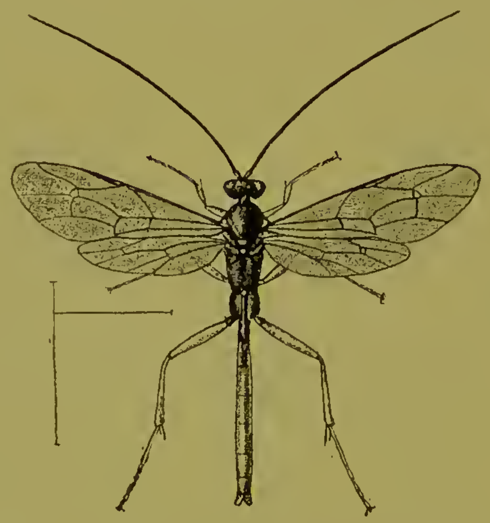

Fig. 131.—*Campoplex himalayensis*, Cam.

black pubescence; scape nitidulous, with sparse long black pilosity. *Thorax* immaculate; mesonotum closely and not strongly punctate, with the notauli shallow and indistinct; metathorax finely rugose basally, from its centre run two curved carinæ, from the middle of which runs a deep and wide depression to the apex of the segment; the entire apex before the carinæ transversely, at the apex more obliquely, strongly striated, and thickly covered with white hair; from near the apices of the two basal carinæ run stout, curved carinæ; at the base of this, on the inner side, two short carinæ, and on the outer side two longer, oblique ones; propleuræ strongly aciculate and centrally obliquely striate; mesopleuræ punctate, sinuately striate and elevated above, strongly carinate and strigose centrally, basally obliquely striate; metapleuræ strigose and punctate, with the base irregularly rugose. *Scutellum* more strongly and rugosely punctate than the mesonotum

postscutellum deplanate, rugose and laterally carinate. *Abdomen* red, with the basal segment except a lateral spot before its apex, second and third broadly above, and the remainder narrowly and not entirely, black. *Legs* red, with all the coxæ, posterior trochanters, and hind femora broadly beneath, black; anterior tibiæ and tarsi subflavidous; hind tarsi blackish. *Wings* unicolorous infumate, slightly violaceous; areolet not petiolate but with the lateral nervures, of which the inner is straight and oblique and the outer subsinuate, coalescent above.

Length 17–18 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

352. **Campoplex confusus**, *Först.*

Campoplex confusus, Förster, Verh. z.-b. Ges. 1868, p. 841; Holmgren, Bih. V.-A. Handl. 1872, p. 62; Bridgman & Fitch, Entom. 1885, p. 17; Thomson, Opusc. Ent. xi, p. 1072 (♂ ♀).
Campoplex nursei, Cameron,* Journ. Bombay Nat. Hist. Soc. 1907, p. 587 (♀).

♂ ♀. A black species, with the legs mainly and the abdomen partly red. *Head*: frons, face, clypeus and external orbits with dense long silvery pubescence; mandibles, except apically, and palpi pale flavous and pilose; face and clypeus closely and rugosely, frons and vertex much more sparsely, punctate. *Thorax* strongly punctate, becoming reticulate at the base of the mesonotum and striate before the scutellum; metanotum closely punctate and subtransversely striate, with no areæ, but with a weak and curved transverse basal carina, before which the punctation is obsolete; pleuræ closely and strongly striate, with the meta- and part of the meso-pleuræ distinctly punctate. *Scutellum* convex, strongly and closely punctate, substriate. *Abdomen* black, with a short apical line on the second segment below and the remaining segments (except irregularly above), rufescent; fourth and sixth segments with larger discal black marks; terebra 1 millim. in length. *Legs*: front pair (except basal femoral lines), apices of intermediate femora with their tibiæ and tarsi, and the hind tibiæ (except sometimes apically), as well as all the calcaria, pale stramineous. *Wings* clear hyaline, with the nervures and stigma pale flavous; areolet large, with its sides subcoalescent above, emitting the recurrent nervure from its centre.

Length 12–15 millim.

PUNJAB: Simla Hills, 7000 ft., v. 09 (*N. Annandale*); RAJPUTANA: Mt. Abu (*Col. Nurse*). EUROPE.

Type of *C. nursei* in Col. Nurse's collection.

The flavous hind tibiæ, which sometimes have a very small black mark below and internally at their base and a broad brunneous apical mark extending to beyond the centre beneath, are said to be characteristic of this species. I have carefully compared the Indian type with the descriptions of *C. confusus*, and

feel but little doubt that they are entirely synonymous, though I possess no European examples and the Oriental specimens have the anus rufescent.

I have drawn the above description from Cameron's typical female.

The species occurs throughout the northern and central districts of Europe sparingly, and is said to have been bred from both Noctuids and Geometrids.

353. **Campoplex buddha**, *Cam.*

Campoplex buddha, Cameron,* Manch. Mem. 1897, p. 26 (♀).

♀. *Head* closely and subuniformly punctate; face and vertex with dense white pubescence; palpi, except basally, testaceous. *Antennæ* shining and with sparse long white pilosity. *Thorax* closely punctate and with dense white hairs, shorter on mesonotum; metathorax longitudinally rugulose, with its apex more coarsely trans-striolate; propleuræ irregularly and obliquely striolate

Fig. 132.—*Campoplex buddha*, Cam.

below; mesopleuræ apically shining and subimpunctate; metapleuræ finely rugose and dull. *Scutellum* distinctly margined laterally. *Abdomen* nitidulous, black, with the third, fourth, and lower half of the fifth segments, red; terebra shortly exserted. *Legs* with white pubescence, black, with the anterior tarsi, tibiæ, and apices of their femora flavous; apices of intermediate femora testaceous; calcaria white. *Wings* hyaline, with the stigma and nervures black.

Length 12 millim.

United Provinces: Mussoori (*Rothney*).

Type in the Oxford Museum.

Very probably the alternate sex of *C. indicatus.*

354. Campoplex indicatus, sp. n.

♂. A dull black species, with only the anterior legs partly and the centre of the abdomen red; anterior legs basally, palpi and mandibles stramineous.

Length 10 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

This insect was indicated by Cameron as the ♂ of *C. indicus* in Col. Nurse's collection and is very similar thereto, calling for no detailed description; it materially differs, however, in having the areolet vertical and distinctly sessile with both submarginal nervures straight, the metanotum neither sulcate nor trans-aciculate centrally, the second segment longer than the discally subinfuscate third, the basal abscissa of the hind wing radius hardly half as long again as the recurrent nervure; the mandibles, except their brunneous apices, anterior coxæ apically, their trochanters and femora internally, and all the calcaria, stramineous, with the anterior tibiæ testaceous and front tarsi white.

I quite expect that it will prove to be the alternate sex of *C. confusus*, Först., or *C. buddha*, Cam.

355. Campoplex reticulatus, sp. n.

Campoplex reticulatus, Cameron MS.

♂. A black species, with the legs sub-immaculate and the abdomen centrally red. *Head* not very narrow posteriorly; frons not carinate; palpi and mandibles black, with the base of the latter narrower than the cheeks. *Antennæ* entirely black, with the basal flagellar joints not discrete. *Metanotum* scabriculous and centrally broadly subimpressed, though not sulcate or carinate, but with a strong and sinuate basal transverse carina; spiracles linear. *Abdomen* obsoletely punctate and black, with the third and fourth and apex of the second segments bright red; postpetiole linear and but little broader than the petiole; genital valvulæ stout and exserted. *Legs* somewhat slender and black, with only the front tibiæ dull castaneous. *Wings* hyaline, with radix, tegulæ, and stigma infuscate; areolet vertical and subsessile, with its sides nearly straight, and emitting the recurrent nervure a little beyond its centre; radius sinuate, basal nervure not quite continuous; basal abscissa of radius of hind wing nearly half as long again as the recurrent; nervellus very slightly curved below, neither geniculate nor intercepted.

Length 8 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

Described from a single male.

356. Campoplex sumptuosus, *Cam.*

Campoplex sumptuosus, Cameron, Manch. Mem. 1897, p. 28 (? ♂).

Head black, closely and uniformly punctate, with dense and short white pubescence, becoming darker and shorter on the vertex; mandibles and palpi dark. *Antennæ* black, with short black pubescence; scape with sparse white pilosity. *Thorax* immaculate and closely punctate; metanotum centrally broadly but not deeply impressed, with "the basal keel roundly curved"; propleuræ strongly and obliquely striolate below; mesopleuræ elevated and trans-aciculate below the radices. *Abdomen* black, with the third, fourth, base of fifth and apex of second segments, red. *Legs* with dense white pubescence, the calcaria black. *Wings* clear hyaline; areolet oblique, and triangular above, emitting the recurrent nervure near its apical third.

Length 7 millim.

CEYLON.

Cameron does not indicate the sex or the colour of the legs, but contents himself with adding that this "is similarly coloured to the preceding two species (*C. buddha* and *C. speciosus*), but is much smaller, and otherwise may be readily separated by the two keels at the base of the median segment [metathorax] being roundly curved," though only one is indicated in his description.

357. Campoplex longipes, *Smith.*

Campoplex longipes, Smith, Scient. Res. 2nd Yarkand Mission, 1878, Hym. p. 21; Waterhouse, Aid Ident. Insect. pt. xxv, 1885, pl. clxii, fig. 5 (♀).

♀. A black species, with the abdomen and legs ferruginous, and the scutellum white. *Head* with the facial orbits, clypeus and mandibles flavescent white, and the last apically ferruginous. *Antennæ* ferruginous throughout. *Thorax* dull and immaculate. *Scutellum* white. *Abdomen* ferruginous and petiolate, with a black spot on the petiolated segment near its apex, and the terebra ferruginous. *Legs* concolorous, with the coxæ and trochanters black, and the apices of the "posterior" tibiæ infuscate. *Wings* hyaline and iridescent, with the nervures and tegulæ ferruginous; costa infuscate.

Length 11 millim.

KASHMIR: Sind Valley (*Dr. Stoliczka*).

Waterhouse's very rough figure, which looks like a ♂, helps us but little to determine the affinities of this species. It shows the alar areolet to be sessile and subpentagonal, with the outer cubital nervure emitted nearly from its centre and the inner nervure curved; the stigma is flavous, the nervellus is postfurcal, intercepted distinctly a little above its centre, and the basal abscissa of the radius in the hind wing is of about the same length as the transverse nervure; but the basal abdominal segment and posterior tibiæ are immaculate red, and the terebra is not represented at all.

From the figure of the areolet it would appear most closely allied, in this respect, to *Campoplex sumptuosus*.

So many European species occur in Kashmir, that the present is probably no more than a synonym of some well-known insect.

358. **Campoplex speciosus**, *Cam.*

Campoplex speciosus, Cameron, Manch. Mem. 1897, p. 27 (? ♂).

Head black, closely and uniformly punctate, with dense silvery pubescence; mandibles flavous, with piceous teeth. *Antennæ* entirely black and longer than the body. *Thorax* immaculate, closely punctate, with dense and short white pubescence; mesonotum longitudinally sulcate centrally; the metathorax "in the middle, in the part below the triangular keel, is irregularly striated; the apex with the striæ more apart, and it is more shining"; mesopleuræ more sparsely punctate. *Abdomen* black, with the third to fifth segments entirely red. *Legs* black; front coxæ and trochanters entirely, the intermediate ones partly, and the anterior femora beneath, bright flavous; front tibiæ and tarsi entirely, and the intermediate tibiæ in front, stramineous; calcaria white, coxæ with silvery pubescence. *Wings* clear hyaline, with the costa and nervures black.

Length 12 millim.

CEYLON.

This species, whose sex is not intimated, is said by its author to be very closely allied to *C. buddha*, but to differ in the large and clearly defined basal triangular metanotal carina.

Genus **ZACHRESTA**, *Först.*

Zachresta, Förster, Verh. pr. Rheinl. 1868, p. 151.

GENOTYPE, *Z. insignis*, Woldst.

This genus is very closely allied to *Campoplex*, but may be recognised from the remainder of the CAMPOPLEGIDES by the following characters. Notauli obsolete or wanting; metanotum not declivous throughout, nor with its apex produced above the hind coxæ; metathoracic spiracles elongate and not circular; scutellum not acutely carinate laterally; abdomen not compressed so soon as at the second segment; its postpetiole distinctly dilated; tibial calcaria distinctly shorter than the metatarsus; hind tarsi not dilated; areolet entire.

Range. United States, Russia, Sikkim.

359. **Zachresta nigromaculata**, *Cam.*

Zachresta nigromaculata, Cameron, Ann. Nat. Hist. xx, 1907, p. 13 (♀).

♀. A flavous species, with very profuse black markings. *Head* closely and somewhat strongly punctate, flavous and with white pubescence, the ocelli, and a large central occipital mark gradually

dilated below, black. *Antennæ* black, with the scape flavous beneath. *Thorax* closely and somewhat strongly punctate, white-pubescent and flavous, with a broad central stripe on the basal two-thirds of the mesonotum, uniting transversely at base with an elongate line above radices, two semicircular basal metanotal marks, an irregular mark below the radices, and an oblique apical mark (obtuse at both extremities) on the mesopleuræ below, black; metanotum subrugosely punctate and not areated, its apical slope broadly impressed centrally. *Abdomen* flavous, with a broad fascia on the constricted base of the postpetiole, another basally incised and apically transverse on centre of second segment, and lateral spots together with the base of the following segments broadly, and a central mark on the third to fifth ventral segments, black; basal segment nearly the length of the second and third united, and distinctly widened apically; the following distinctly not laterally compressed; terebra 1 millim. in length. *Legs* concolorous with the body; hind coxæ broadly at the base beneath, their trochanters basally, femora externally towards and entirely at the base and apex, and their tarsi (except the basal half of metatarsus), black; tibiæ sparsely, and the tarsi more closely, spinulose; calcaria elongate and about three-fourths the length of the metatarsus. *Wings* hyaline, with the stigma and nervures black; areolet very small, elongately petiolate, emitting the recurrent nervure from its apex; basal nervure not continuous through the median; hind wings with radius and cubitus subobsolete, and external nervures obsolete.

Length 9 millim.

SIKKIM (*Col. Bingham*).

The abdominal segments are said to be distinctly broad compared with those of *Campoplex*; in fact, "the only difference between this species and *Campoplex* of much importance," says its author, "lies in the abdomen not being strongly compressed, the latter genus having also the metanotum longer and more or less areolated." It differs from *Echthronomas*, Förster (Verh. pr. Rheinl. 1868, p. 151), in having the calcaria very distinctly shorter than the metatarsi.

Genus RHIMPHOCTONA, *Först.*

Rhimphoctona, Förster, Verh. pr. Rheinl. 1868, p. 153.

GENOTYPE, *Pyracmon fulvipes*, Holmg.

Head not cubical, broadly transverse and but little constricted posteriorly; clypeus short, not discrete from the face and often apically dentate in the centre. Antennæ stout, setaceous and fully three-quarters the length of the body. Thorax stout, with the speculum somewhat dull; metathorax declivous throughout and a little produced apically, with distinct areæ; costulæ entire; spiracles exactly oval. Scutellum not deplanate or margined. Abdomen strongly compressed from base of the third segment; terebra elongately exserted. Legs slender, with the claws distinctly pectinate. Radial cell sublanceolate, nearly thrice as long

as broad; areolet entire and sometimes sessile, emitting the recurrent nervure but very slightly before its apex; nervellus distinctly geniculate below its centre and sometimes emitting a distinct nervure.

Range. Europe, Assam.

This genus was erected with no type; but recently Professor Schmiedeknecht, following Tschek, has referred *Pyracmon fulvipes*, Holmg. (Sv. Ak. Handl. 1858, p. 102) to it. An Indian pair, differing only in the absence of the clypeal production and in the shape of the areolet, appears also to belong to it.

360. **Rhimphoctona pluto**, sp. n.

♂ ♀. A dull black species, with white pilosity and part of the legs and abdomen pale. *Head* immaculate, with only the palpi testaceous; frons simple and trans-aciculate; clypeus apically very broadly rounded; laterally subreflexed and centrally not produced; eyes entire. *Antennæ* with the scape dull rufescent beneath. *Thorax* with the mesonotum abruptly sloping apically; metathorax gradually declivous throughout and apically a little produced between the hind coxæ; discally bicarinate throughout, with the petiolar area as long as, though broader than, the parallel-sided areola, which is thrice as long as broad, discrete from the minute basal area and emitting costulæ from its basal third; lateral carinæ strong and remote. *Scutellum* subconvex and not bordered. *Abdomen* slender, black, with griseous pilosity, the fourth and fifth segments dull red in ♂, the third to fifth with apical half of second and disc of anus bright red in ♀; basal segment straight and discally intumescent from just beyond its centre to its apex; second deplanate and scabrous; third strongly compressed and hardly smoother; the following also compressed and subnitidulous; valvulæ exserted; terebra slightly reflexed and as long as the basal segment. *Legs* slender and black, with all the calcaria, the anterior tibiæ and tarsi, and the front femora internally, testaceous; claws pectinate. *Wings* not narrow, hyaline, with the tegulæ and stigma black, and the radix testaceous; areolet not large, distinctly petiolate and emitting the recurrent nervure hardly before its apex; second discoidal cell externally subacute; basal nervure continuous; nervellus strong and geniculate below its centre, but emitting no nervure.

Fig. 133.
Rhimphoctona pluto, Morl.

Length 12 millim.

ASSAM: Shillong, viii. 03 (*Rowland Turner*).

Type in the British Museum.

Described from a single pair.

Genus DELOPIA, *Cam.*

Delopia, Cameron, Zeits. Hym.-Dipt. iii, 1903, p. 304.

GENOTYPE, *D. cariniscutis*, Cam.

Eyes nude and internally emarginate; cheeks thrice the length of the second antennal joint; clypeus basally not discrete and apically broadly rounded. Metanotum short, obliquely declivous throughout, gradually constricted apically, longitudinally carinate, with two entire areæ an either side, but the discal one wanting: metanotal spiracles about thrice as long as broad: metapleural carinæ entire. Scutellum subdeplanate, broader than long, and laterally impressed before the carinate sides. Abdominal petiole elongate, slender and glabrous; postpetiole but very slightly dilated. Legs slender and short, with the calcaria fully half the length of the metatarsi; claws small and simple; tibiæ and tarsi spinulose. Wings with the areolet shortly petiolate, and the basal nervure not continuous through the median.

Range. Sikkim.

The conformation and abdominal structure of this genus is analogous with those of *Campoplex*; it is, however, readily recognised by the discally subdeplanate, laterally sulcate and carinate scutellum, and by the peculiar disposition of the metanotal carinæ.

361. Delopia cariniscutis, *Cam.*

Delopia cariniscutis, Cameron, Zeits. Hym.-Dipt. iii, 1903, p. 337 (♀).

♀. A black species, with the abdomen centrally and the tibiæ mainly red. *Head* black, with only the mandibles testaceous red above; face and clypeus closely, distinctly and uniformly punctate and white pubescent, with the epistoma subprominent. *Antennæ* with the flagellum brunneous beneath. *Thorax* closely punctate and immaculate; metanotum irregularly trans-striate, broadly impressed centrally, with a narrow glabrous sulcus on the exareate disc; its sides with a large basal, and an elongate apical, area; pro- and meso-pleuræ closely punctate, with the former glabrous and nitidulous below: metapleuræ closely rugulose below, and more coarsely and obliquely striate above, the carinæ. *Scutellum* subdeplanate and hardly higher than the mesonotum, irregularly rugose, less strongly

Fig. 134.
Delopia cariniscutis, Cam.

basally; distinctly carinate laterally. *Abdomen* black, with the third to fifth, and sides of the second, segments rufescent; petiole glabrous and nitidulous. *Legs* black, with the tibiæ mainly, and their calcaria, testaceous. *Wings* hyaline, with the stigma and nervures testaceous; areolet shortly petiolate.

Length 12 millim.

SIKKIM: Darjiling.

Genus ERIOBORUS, *Först.*

Erioborus, Förster, Verh. pr. Rheinl. 1868, p. 153.

GENOTYPE, *Campoplex perfidus*, Grav.

Head somewhat distinctly constricted behind the internally entire and parallel eyes; clypeus with but small lateral foveæ, and apically rounded. Metathoracic areola usually pentagonal, with strong costulæ; spiracles circular. Abdomen not apically clavate; terebra not extending beyond the anus. Hind metatarsus half the length of its tibia. Stigma distinct; anal nervure not continuous; areolet entirely wanting; nervellus neither geniculate nor intercepted.

Range. Palæarctic Region.

I follow Schmiedeknecht in retaining Förster's typeless genus, which is a convenient division of *Anilasta*, Thoms., for those species lacking an areolet; though it is certainly not generically distinct.

362. Erioborus perfidus, *Grav.*

Campoplex perfidus, Gravenhorst, Ichn. Europ. iii, 1829, p. 595 (♀).
Anilasta perfida, Thomson, Opusc. Ent. xi, p. 1175 (♀).
Erioborus perfidus, Schmiedeknecht, Opusc. Ichn. p. 1646 (♀).

♀. A black species with white pilosity and with the abdomen and anterior legs apically red. *Head* posteriorly narrow, with the palpi and centre of mandibles flavescent. *Antennæ* longer than half the body and somewhat slender. *Thorax* immaculate, with the central metanotal areæ distinct, though not very strong; areola subhexagonal, basally constricted and emitting costulæ before its centre; spiracles circular. *Abdomen* strongly compressed, red, with the first, basal two-thirds of the second segment, and the very shortly reflexed terebra, black. *Legs* with the anterior femora and tibiæ mainly rufescent; hind legs black, with their femora at the extreme apex, and tibiæ broadly in the centre, dull red. *Wings* hyaline, with the stigma piceous and the tegulæ testaceous; basal nervure not continuous; nervellus entire.

Length 7–8 millim.

SIKKIM: Darjiling (*E. Brunetti*). EUROPE.

Type in the Breslau Museum.

I feel no hesitation in referring a female from Darjiling to this

species, of which however I have no other knowledge. It agrees better with Gravenhorst's variety from Breslau than with the typical Hannoverian female; elsewhere it is only recorded by Thomson from Sweden.

Genus DIOCTES, *Först.*

Dioctes, Förster, Verh. pr. Rheinl. 1868, p. 153.

GENOTYPE, *D. trochanterata*, sp. n.

Head posteriorly constricted; mandibles stout and equidentate; cheeks obsolete; clypeus apically rounded and basally not discrete from the very slightly convex, parallel-sided and subtransverse face; eyes internally broadly emarginate; ocelli remote and not large. Antennæ shorter than the body, with the scape entirely pale. Metanotal areæ strong and entire; petiolar area distinctly excavate; spiracles circular. Scutellum not strongly deplanate or broader than long, with no carinæ, and the basal sulcus elongately pilose. Abdomen compressed from base of third segment; basal segment not elongate, widened from the centre; petiole glabrous and linear, postpetiole somewhat strongly subfusiform, with sparse pilosity and the spiracles at its centre; anus not clavate; terebra half the length of the abdomen, with the spicula reflexed. Trochanters entirely pale; hind tibiæ blackish at both extremities. Wings with the stigma narrow; areolet wanting; radial cell not broad and very obtusely angled centrally; anal nervure emitted from centre of first recurrent; hind wings with the nervellus straight, vertical and not intercepted, all apical nervures wanting.

Range. Palæarctic Region.

This genus agrees with *Hymenobosmina* in the internally parallel and emarginate eyes, and in lacking an areolet; but it differs materially in the circular metathoracic spiracles, short cheeks and basal segment, and to a less extent in the equidentate mandibles, shorter antennæ, longer scutellum, stout postpetiole and subconvex face. It is very probable that a great number of species falling here are to be met with in India, though too little collecting has at present been effected to speak with any degree of certainty.

The above generic characters are drawn from *D. trochanterata*, since Förster's description is most meagre.

Table of Species.

1	(4)	Calcaria shorter than half the metatarsus; abdomen black.	
2	(3)	Scape beneath and the hind femora fulvous.	*apostata*, Grav., p. 471.
3	(2)	Scape pale throughout; hind femora black	*trochanterata*, sp. n., p. 471.

4 (1)	Calcaria longer than half the metatarsus; abdomen nearly entirely red.	
5 (10)	Areola not transverse; scape and trochanters pale.	
6 (9)	Smaller (4–7 millim.); terebra shorter than half basal segment.	
7 (8)	Hind coxæ black; areola elongate	*vulgaris*, sp. n., p. 472.
8 (7)	Hind coxæ mainly pale; areola subquadrate	*debilis*, sp. n., p. 473.
9 (6)	Larger (9 millim.); terebra as long as the basal segment	*argenteopilosa*, Cam., p. 473.
10 (5)	Areola transverse; scape and trochanters black	*albicalcar*, sp. n., p. 474.

363. **Dioctes apostata**, *Grav.*

Campoplex apostata, Gravenhorst, Ichn. Europ. iii, 1829, p. 510 (♀).
Limneria apostata, Bridgman & Fitch, Entom. 1885, p. 105 (♀).
Angitia apostata, Thomson, Opusc. Ent. xi, p. 1161 (♂ ♀).
Dioctes apostata, Schmiedeknecht, Opusc. Ichn. p. 1643 (♂ ♀).

♂ ♀. A black species, with the legs, excepting the black hind coxæ, trochanters and apices of their tibiæ, pale. *Head* but slightly constricted posteriorly, black, with the palpi flavescent. *Thorax* immaculate; mesopleuræ distinctly punctate, with the interstices alutaceous and the speculum dull; metathorax finely rugulose, with weak costulæ. *Abdomen* entirely black and fully double the length of the terebra. *Legs* fulvous, with the hind ones partly black, and the anterior coxæ and trochanters flavous. *Wings* hyaline, with the stigma narrow and testaceous, the tegulæ whitish; basal nervure continuous.

Length 5–6 millim.

Bengal: Pusa, iv. 05 (Pusa coll.); Ceylon: Diyatalawa, 4000 ft., ix. 07 (*T. B. Fletcher*). Europe.

Type in the Breslau Museum.

364. **Dioctes trochanterata**, sp. n.

♂ ♀. A dull black species with long white pubescence, the mandibles, palpi, whole scape, radix, tegulæ, anterior legs, hind trochanters and calcaria, with the centre of their tibiæ broadly and their tarsi (except apices of the joints above), stramineous; flagellum ferruginous throughout. *Head* distinctly punctate and posteriorly not very narrow. *Thorax* with the metathorax scabrous and somewhat nitidulous, the basal area triangular; areola hexagonal, basally acuminate and longer than broad, emitting the strong costulæ from before its centre. *Wings* with the stigma and nervures piceous.

Length 7 millim.

Ceylon: Batticaloa, iv. 06 (*E. E. Green*).

Type in the author's collection.

This species appears to be closely allied to *Limneria elishæ*, Bridg. (Trans. Ent. Soc. 1884, p. 426), but it is very much larger and its metathoracic costulæ are distinctly more prominent.

Green bred two males and three females of this distinct species from the Cocoanut caterpillar, *Nephantis seriopa*; there is a broken specimen, which I fancy may also belong here, in the Pusa collection, bred on 26th October, 1904, from the Pyralid moth, *Antegastra catalaunalis*, at Surat in Bombay.

365. **Dioctes vulgaris**, sp. n.

♂ ♀. A small black species, with somewhat dense silvery pubescence, the legs mainly and most of the abdomen red; metanotal areola elongate. *Head* distinctly constricted behind the glabrous and internally very broadly emarginate eyes; clypeus with no apical tooth or lateral foveæ; face of ♀ not apically constricted; frons deplanate and simple; mandibles and palpi entirely testaceous. *Antennæ* longer than half the body, filiform and black, with the flagellar joints elongate; scape clear testaceous, with a single black external line. *Thorax* immaculate, a little longer than high; metathorax short, with its petiolar area strongly concave; areola hexagonal and half as long again as broad, emitting distinct costulæ before its centre; basal area minute aud triangular; lateral carinæ strong, spiracles small and oval. *Scutellum* black and not convex. *Abdomen* red, pubescent and strongly compressed from base of the third segment; basal segment except at its extreme apex, the basal two-thirds of the second except laterally, and in ♂ often base of third segment, black; first segment elongate and linear to near its suborbicular apex, second finely shagreened and slightly widened apically, with its conspicuous thyridii red; ♂ valvulæ stout and rufescent; terebra not longer than half the basal segment, though distinctly exserted, black and subreflexed. *Legs* somewhat slender but not elongate, clear red, with the anterior trochanters basally and the hind ones paler; hind coxæ entirely and the extreme base of the intermediate ones black; hind tarsi, apices of their tibiæ, and base of their femora externally, blackish; hind metatarsus half the length of its tibia. *Wings* hyaline, with the radix and tegulæ stramineous, stigma distinct and piceous; areolet wanting; basal nervure slightly postfurcal; radial cell not broad; nervellus entire and not geniculate.

Length 6–7 millim.

United Provinces: Mussoori, x. 06 (*H. M. Lefroy*); Bengal: Chapra (*Mackenzie*, type), Pusa, i. 05, and Behar, x. 07 (*G. R. Dutt* —Pusa coll.); Ceylon: Peradeniya, iii. 06 (*E. E. Green*).

Type in the Pusa collection.

This species appears very similar to *Hymenobosmina spinipes*, Cam., which I do not know, and Cameron makes no mention of the metathoracic spiracles, though in his figure (*loc. cit.*) the

antennæ are much shorter and the abdomen apically broader than in the present female. It is smaller, with the terebra shorter, than *D. argenteopilosa*.

D. vulgaris must be extremely abundant in Bengal, whence I have seen more than a score of specimens. Dr. Thwaites found a pair in Ceylon in 1873, and Green bred one at Peradeniya from the case of an undetermined Psychid moth.

366. **Dioctes debilis**, sp. n.

♀. A small black species with somewhat dense silvery pubescence, the legs almost entirely and most of the abdomen red: metanotal areola not longer than broad.

Length 4 millim.

CENTRAL PROVINCES: Nagpur; BOMBAY: Surat.

Type in the Pusa collection.

Extremely like small specimens of *D. vulgaris*, but differing in having the scape almost entirely stramineous, the flagellum very distinctly red beneath, the areola not longer than broad and emitting its costulæ from the exact centre, second segment laterally and apically ochraceous, with the fourth, fifth, and sixth discally blackish, all the coxæ clear stramineous, with the basal half of the hind ones blackish only below, base of the hind tibiæ but not of their femora blackish.

I have seen two females in the Pusa collection, which I am satisfied are distinct from *D. vulgaris*, if only on the evidence of their metanotal structure. The type was bred from the Pterophorid moth, *Exelastis atomosa*, Wlsm., at Surat, and the second specimen from another Pterophorid, *Sphenarches caffer*, Zell. The cocoon is white and hairy, 5 millim. in length, and the imago had emerged from an irregularly circular hole, distinctly before its apex.

367. **Dioctes argenteopilosa**, *Cam.*

Zaporus? argenteopilosus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1907, p. 590 (♀).

♀. A black species, with dense and somewhat long silvery pubescence. *Head* closely and rather strongly punctate, with the clypeus not discrete and apically rounded; the large mandibles, except apically, and the palpi rufescent; labrum broad and prominent. *Antennæ*: scape bright and conspicuous red, with a black discal line. *Thorax* closely and somewhat strongly punctate; metathorax dull and scabrously punctate, with the basal area transverse and inconspicuous; areola subparallel-sided, longer than broad and apically emarginate, with its basal angles rounded and strong costulæ emitted near base; petiolar area subquadrate, with complete carinæ and subexcavate, with only its apex subdiscrete; spiracles small and exactly circular. *Scutellum* prominent and

convex; postscutellum with dense silvery pubescence. *Abdomen* broadest behind centre, distinctly punctate, apically smoother and shining, with the second segment not aciculate; postpetiole distinctly dilated; second and third segments basally constricted, laterally and all the following entirely bright red; terebra slightly longer than the basal segment or one-third the abdominal length, with the spicula reflexed. *Legs* red, with the anterior paler; hind ones with coxæ, base of femora and tibiæ, apices of latter and of tarsi, black; claws spinulose. *Wings* hyaline and not ample, tegulæ flavescent, stigma and nervures black; areolet wanting; submarginal emitted before, and only one-third shorter than, the second recurrent; basal nervure subcontinuous; radial cell long and subacuminate at both extremities; all apical nervures in hind wing entirely wanting; nervellus straight and not intercepted.

Length 9 millim.

CENTRAL PROVINCES: Nagpur (Pusa coll.); BOMBAY: Deesa, vi. 98 (*Col. Nurse*, type).

Type in Col. Nurse's collection.

Cameron's description of the legs and shape of the metathoracic spiracles is very faulty. Unfortunately, he had formed a misconception of the spiracular shape, and, as a matter of fact, so far from being related to *Zaporus*, this species differs from his own genus *Bosmina* only in having the metathoracic spiracles circular and the apex of the scutellum not margined. Its facies is stouter, the abdomen is broader apically and its petiole is not quite so elongate.

I have drawn the above description from the type. In the Pusa collection are eleven specimens, all females, from Nagpur, one bred from the Noctuid moth, *Caradrina exigua*, Guen., and attached to its own unicolorous brown, hairy, cylindrical cocoon, which is abruptly rounded and of equal breadth at both extremities; one of the others was bred from a similar cocoon.

368. **Dioctes albicalcar**, sp. n.

Fig. 135.
Dioctes albicalcar, Morl.

♂ ♀. A small black species with somewhat dense silvery pubescence, the legs and abdomen apically rufescent, metanotal areola transverse and the calcaria pale.

Length 6 millim.

BENGAL: Pusa, iv. 06 and iv. 07 (Pusa coll.); ASSAM: Shillong, v. 03 (*Rowland Turner*).

Type ♀ in the British Museum.

Very closely allied to the last species and only differing in its immaculate black scape; the transversely triangular areola, which is confluent with the elongate petiolar area; the non-aciculate

second abdominal segment; the abdomen red from the centre of the second segment; the terebra shorter than the basal segment and strongly reflexed; all the coxæ and trochanters black; all the calcaria stout and very pale stramineous.

I have seen only a single female, and there are two males in the Pusa collection.

Genus TROPHOCAMPA, *Schm.*

Trophocampa, Schmiedeknecht, Hym. Mitteleurop. 1907, p. 598.

GENOTYPE, not cited.

Head transverse and posteriorly constricted, with the eyes distinctly emarginate internally and the face hardly constricted apically. Antennæ about half the length of the body. Metathorax longitudinally impressed centrally, often with some traces of basal areæ; areola wanting; spiracles circular or shortly oval. Abdomen, at least apically, strongly compressed; terebra distinctly a little exserted. Areolet entire and subregular.

Range. Palæarctic Region.

This genus was recently erected for the reception of those species of *Campoplex* with circular or subspherical metathoracic spiracles and differs in no other feature, excepting the extension of the epipleuræ to the apex of the third segment.

369. Trophocampa indubia, sp. n.

♀. A black species with white pubescence, the abdomen mainly red and the anterior legs stramineous. *Head* strongly constricted posteriorly, with the palpi and mandibles flavescent. *Antennæ* longer than half the body and apically attenuate, with the two basal flagellar joints subequal in length. *Thorax* longer than high, dull and alutaceously punctate; metathorax obliquely declivous and with white hairs throughout, centrally impressed, but with no areæ; spiracles circular. *Scutellum* a little convex. *Abdomen* discally linear, with the third and following segments strongly compressed and red, apex of the second red; basal segment much longer than the hind coxæ and trochanters, with the postpetiole ovate and longer than broad; second segment more than twice as long as broad and obsoletely alutaceous, slightly widened apically and narrowly red laterally from the thyridii; third half as long again as the breadth of its black base; terebra as long as the second segment. *Legs* black, with the anterior tibiæ and front femora stramineous; hind tibiæ centrally fulvescent and, at extreme base, white before the subbasal dark fascia. *Wings* hyaline, with the stigma black and the tegulæ pale; radial cell twice as long as broad and apically straight; areolet elongately petiolate, emitting the recurrent nervure beyond its centre; nervellus neither geniculate nor intercepted.

Length 10 millim.

UNITED PROVINCES: Bhim Thal, Kumaon, 4500 ft., ix. 07.

Type in the Indian Museum.

Evidently closely allied to *T. dubia*, Tschek (Verh. z.-b. Ges. 1871, p. 57); but quite distinct in its entire nervellus, longer terebra and mainly red abdomen.

Genus **CASINARIA**, *Holmg.*

Casinaria, Holmgren, Sv. Ak. Handl. 1858, n. 8, p. 48; id. Öfv. 1858, p. 325.

GENOTYPE, *Campoplex viduus*, Grav.

Head short, transverse and posteriorly constricted; clypeus not discrete, apically simple and broadly rounded laterally, though not deeply foveate; eyes glabrous and internally parallel, though very distinctly emarginate next the scrobes; mandibles small with the teeth of equal length. Metanotum gradually declivous throughout, with no areæ and its centre longitudinally canaliculate; metathoracic spiracles shortly oval. Abdomen apically clavate, and not strongly compressed laterally throughout; thyridii large; terebra not extending beyond the anus. Legs slender, with the tarsal claws small. Stigma narrow, emitting the radial nervure from its centre; areolet regular and petiolate; second discoidal apically subacute.

370. **Casinaria atrata**, sp. n.

Limnerium atratum, Cameron MS.

♂ ♀. An elongate, dull black species with the anterior legs alone partly pale; much resembles the Fossor, *Trypoxylon attenuatum*, Smith. *Head* small, distinctly constricted posteriorly, black, with the extreme apices of the stout mandibles alone piceous; palpi white. *Antennæ* immaculate and a little longer than half the body. *Thorax* slightly longer than high and strongly pilose; notauli wanting; metanotum with traces of a weak carina on either side of the base only, its centre distinctly impressed longitudinally and trans-aciculate; spiracles short oval, and contiguous with the weak external lateral carinæ. *Abdomen* very elongate and apically clavate, black, with the thyridii and extreme apical angles of the second segment badious; venter centrally testaceous; basal segment linear, with the postpetiole laterally rounded and a little longer than broad; second segment twice as long as broad, and the third very slightly longer than broad; terebra distinct, stout and hardly

Fig. 136.
Casinaria atrata, Morl.

extending beyond the anus. *Legs* dull black, with the anterior tarsi, tibiæ and apices of their femora white; intermediate tibiæ darker; hind tibiæ white only at their extreme base, their tarsi black throughout. *Wings* ample and hyaline, with the stigma and tegulæ black, and radix testaceous; areolet not small, distinctly petiolate and emitting the recurrent nervure from slightly beyond its centre; second discoidal cell apically acute; basal nervure postfurcal; nervellus entire and not intercepted.

Length 10 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

Evidently closely allied to *C. albipalpis*, Grav., but differing slightly in its larger size, the position of the second recurrent nervure, in the colouring of the legs, and in having the apical radial abscissa very distinctly longer than the basal.

Described from a single female; but I am inclined to regard two males, in the Calcutta Museum, captured by Brunetti at Darjiling, on 20th October, 1905, as representing the alternate sex of this species. They differ only in having the mandibles and the anterior trochanters entirely white, with the metanotum longitudinally bicarinate; the antennæ are nearly as long as the body.

Genus **SINOPHORUS**, *Schm.*

Sinophorus, Schmiedeknecht, Opusc. Ichn. 1908, p. 1649; (?) Förster, Verh. pr. Rheinl. 1868, p. 153.

GENOTYPE, *S. thuringiacus*, Schm.

Head transverse and distinctly constricted posteriorly; eyes glabrous, internally parallel and but slightly emarginate next the scrobes; clypeus apically rounded, with small lateral foveæ. Antennæ slender, longer than half the body and apically attenuate. Thorax but little longer than high; metanotum centrally impressed, with obsolete basal carinæ only; spiracles small and circular. Abdomen not strongly compressed apically; postpetiole distinct and a little longer than broad, double the breadth of the petiole; second segment slightly longer, and third not longer, than broad; terebra about half the length of the abdomen. Legs not very slender, with the tibiæ externally spinulose; calcaria elongate, reaching centre of metatarsus; claws distinctly pectinate. Wings with the radius but slightly angled above the areolet, with its apical abscissa distinctly the longer and apically straight; areolet petiolate, emitting the recurrent nervure beyond its centre; basal nervure continuous, and the lower angle of second discoidal cell acute; anal nervure emitted but slightly below centre of the brachial cell; nervellus obsoletely geniculate below its centre, but not intercepted.

Range. Central and Southern Europe, Egypt, Himalayas.

Förster's diagnosis of this genus is all too short, and may nowadays advantageously be ignored in favour of that so well drawn recently by Dr. Schmiedeknecht, which differs from our Indian representative only in its curved radius, which is said to have the apical abscissa double the length of the basal, the areolet large and the postpetiole quadrate.

371. **Sinophorus collinus**, sp. n.

Limnerium collinum, Cameron MS.

♀. A black species with white pubescence and only the palpi, front legs (except basally), intermediate tibiæ and tarsi, the hind calcaria and centre of the venter, testaceous; hind tibiæ obsoletely badious centrally; terebra hardly half the length of the abdomen.

Fig. 137.
Sinophorus collinus, Morl.

Length 8½ millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

The generic characters will easily distinguish this hill species from its allies; the areolet is oblique, somewhat elongately petiolate but not large, the radius curved only where it is emitted from the centre of the stigma, its outer abscissa is only about half as long again as the inner, and the postpetiole is evenly rounded throughout.

Described from a single specimen.

Genus **OLESICAMPA**, *Thoms.*

(?) *Olesicampe*, Förster, Verh. pr. Rheinl. 1868, p. 153.
Olesicampa, Thomson, Opusc. Ent. xi, 1887, p. 1139.

GENOTYPE, *Ichneumon fulviventris*, Gmel.

Head subcubical and posteriorly broad, with the eyes internally parallel and not emarginate; cheeks buccate and somewhat long, with their costæ inflexed; mandibles flavous, elongate and stout, their apices not angled and the lower tooth the longer; clypeus apically subtruncate, with small lateral foveæ. Antennæ with the scape large and white beneath; flagellum elongate and in ♀ usually pale apically. Thorax cylindrical, with the pronotum sometimes

striolate; metathoracic petiolar area short; areola subpentagonal and occasionally obsolete. Abdomen subcylindrical; basal segment laterally acute, with the petiolar glymmal sulci distinct; second segment longer than broad, with obsolete thyridii; terebra not extending beyond anus. Legs somewhat stout, with their calcaria not extending beyond centre of metatarsus; tarsal claws basally pectinate. Wings with the areolet shortly petiolate and not small, emitting the recurrent nervure beyond its centre; radial cell not broad; second discoidal externally subacute; basal nervure continuous; nervellus vertical and not intercepted.

Förster's typeless genus may be synonymous with that so well set forth by Thomson; but in any case his few words are quite inadequate to justify the recognition of his name.

372. **Olesicampa flavicornis**, *Thoms.*

Olesicampa flavicornis, Thomson, Opusc. Ent. xi, p. 1143 (♂ ♀).
Limnerium clypealis, Cameron MS.

♂ ♀. A black species with silvery pubescence, and the legs and abdomen mainly red. *Head* not quite parallel behind the internally parallel but not emarginate eyes; apex of clypeus broadly pale. *Antennæ* black and flavescent beneath. *Thorax* with a white callosity before the tegulæ; pronotum not striolate; metanotal areæ very distinct; areola hexagonal and twice as long as broad, discrete from the petiolar area and emitting costulæ far before its centre; basal area elongate; spiracles small, circular and subcontiguous to the upper lateral carinæ. *Abdomen* red, with the base alone black in both sexes; glymmal sulci distinct and rising from the base of the petiole; ventral plica fulvous throughout; terebra normal. *Legs* fulvous, with the hind coxæ and femora entirely black, their tibiæ and the tarsal joints apically blackish; all the trochanters bright stramineous. *Wings* with the tegulæ white and the stigma pale.

Fig. 138.
Olesicampa flavicornis, Thoms.

Length 6–7 millim.

Punjab: Simla, ix. 98 (*Col. Nurse*); Sikkim: Darjiling, 6000 ft., x. 08 (*E. Brunetti*—Ind. Mus.).

Genus LIMNERIUM, *Ashmead.*

Limneria, Holmgren (*nec* Adams), Öfv. Sv. Ak. Förh. 1858, p. 326; Thomson, Opusc. Ent. xi, 1887, p. 1103.
Limnerium, Ashmead, Canad. Entom. xxxii, 1900, p. 368.
Eulimneria, Schmiedeknecht, Opusc. Ichn. 1909, p. 184.

Genotype, *Ichneumon albidus*, Gmel.

Head not abruptly constricted posteriorly; clypeus with small lateral foveæ; mandibles short and stout, but little narrowed apically. Antennæ stout and apically subattenuate. Thorax not pale-marked; metanotum distinctly excavate longitudinally throughout, with the areæ indistinct and the basal costa alone determinate; basal area short and often transverse; spiracles not elongate. Abdomen somewhat broad and but little compressed apically; petiole not narrow, with the lateral foveæ obsolete; postpetiole distinct and but slightly rounded laterally; terebra stout. Legs not slender, with the tarsal claws only basally subpectinate, and the hind tibiæ often dark-banded before their base. Wings hyaline; areolet somewhat large and regularly triangular, often elongately petiolate and emitting the recurrent nervure near its centre; basal nervure suboblique, second discoidal cell not apically acute; nervellus neither oblique nor intercepted.

Range. Holarctic Region, India, Ceylon.

This is the typical genus of the small Campoplegides with circular spiracles, and it has gone through various degrees of contraction. Holmgren's original broad and well-marked diagnosis was subdivided by Förster, in 1868, into numerous small genera, of which the typical one—the fifty-eighth—was allowed to retain but the single character: "The postpetiole with distinct lateral margins." Many of these genera have since been elaborated in a scholarly manner by Professor Thomson, and a few more employed by Dr. Schmiedeknecht, who considers it necessary to change the name of the genus from Ashmead's amended form, because that might be taken to indicate the old *Limneria* in its broad sense and not the restricted *Limneria* of Thomson, to which it was most obviously applied by its author. The genus *Ichneumon* might fall on the same grounds!

I here use the genus in as restricted a sense as possible in the circumstances; that is to say, whenever I have had an opportunity of examining Cameron's types I have relegated them to this or other genera (more often the latter), but in several cases I have had to fall back upon the almost invariably inadequate descriptions, with the result that species of the genus as here set forth cannot be considered entirely homogeneous, for some have pale markings on the abdomen, the terebra hardly exserted, the scape pale beneath, etc. Possibly some of those at present included here should be relegated to *Omorgus*, which also has the metanotum longitudinally excavate; if so, I have been unable to separate them. However this may be, I trust the following table

will prove to some extent reliable in the elucidation of these small and inconspicuous insects, though specimens should by no means be forced to represent descriptions with which they do not entirely agree, for we as yet know but a small percentage of the indigenous kinds.

Table of Species.

1 (2)	Abdomen red; 1st segment, base of 2nd and centre of 3rd, black	*buddha*, Cam., p. 482.
2 (1)	Abdomen not so coloured.	
3 (22)	Metanotum not strongly impressed; areola laterally entire.	
4 (17)	Areola not longer than broad, confluent with petiolar area.	
5 (6)	Hind tibiæ centrally, and tarsi basally pure white	*fuscicarpus*, Thoms., [p. 482.
6 (5)	Hind legs with no pure white markings.	
7 (10)	Areolet distinctly and elongately petiolate.	
8 (9)	Metanotum short, convex and centrally rugulose	*forticarinatum*, Cam., [p. 483.
9 (8)	Metanotum elongate, deplanate and centrally glabrous................	*quettaense*, Cam., [p. 483.
10 (7)	Areolet sessile or indistinctly petiolate.	
11 (14)	Scape immaculate; terebra longer than basal segment.	
12 (13)	Abdomen black; antennæ filiform ..	*crassifemur*, Thoms., [p. 485.
13 (12)	Abdomen broadly red; antennæ slightly thickened apically	*volens*, Cam., p. 485.
14 (11)	Scape pale beneath; terebra hardly exserted.	
15 (16)	Anterior coxæ entirely pale; abdomen black	*renovatum*, nom. n., [p. 486.
16 (15)	Anterior coxæ basally black; abdomen mainly ferruginous	*indicum*, Cam., p. 487.
17 (4)	Areola longer than broad, apically discrete; scape entirely black.	
18 (21)	Areolet triangular, emitting recurrent nervure beyond its centre.	
19 (20)	Speculum finely punctate; abdomen entirely black	*himalayense*, Cam., [p. 488.
20 (19)	Speculum glabrous; abdomen in part red	*agraense*, Cam., p. 488.
21 (18)	Areolet quadrate, emitting recurrent from its centre	*taprobanicum*, Cam., [p. 489.
22 (3)	Metanotum strongly impressed; areola obsolete.	
23 (24)	Abdomen black; scape pale beneath . .	*parvicarinatum*, Cam., [p. 490.
24 (23)	Abdomen broadly red; scape entirely black.	
25 (26)	Thorax sparsely pubescent; stigma testaceous; length 5 millim.	*morosum*, Cam., p. 491.
26 (25)	Thorax densely pubescent; stigma black; length 7 millim.	*ceylonicum*, Cam., [p. 491.

373. Limnerium buddha, *Cam.*

Limneria buddha, Cameron,* Manch. Mem. 1899, p. 124 (♀).

♀. *Head* black, with the mandibles (except apically) and palpi flavous; face and clypeus uniformly and somewhat strongly punctate and pubescent; frons and vertex less strongly punctate, more sparsely and shortly pubescent. *Antennæ* black, with the scape flavous, blackish above and with long pale pubescence beneath; flagellum with dense short black pubescence. *Thorax* closely punctate, black, with silvery pilosity; mesonotum with sparse dark pubescence; metathorax trans-aciculate apically in the centre, the central keel longish; the lateral roundly curved; propleuræ closely punctured, running into longitudinal striations; the mesopleuræ closely punctured; the oblique depression, in the middle behind, finely striated; the metapleuræ similarly punctured; the curved keel in the centre stout, attenuated at the apex. *Scutellum* less strongly punctate than the mesonotum, its basal fovea with white pubescence; postscutellum deeply foveolate, and externally nitidulous, laterally. *Abdomen* red, with the first segment, basal three-fourths of second, and centre of third basally, black; venter centrally flavous; terebra 2 millim. in length, with the valvulæ black. *Legs*: anterior pairs fulvous, with the coxæ and trochanters flavous; hind legs subrufescent, with the coxæ, tarsi, and base and apex of their tibiæ blackish; calcaria flavous. *Wings* hyaline, with the stigma dark.

Length 7 millim.

Assam: Khasi Hills (*Rothney*).

Type in the Oxford Museum; badly broken.

374. Limnerium fuscicarpus, *Thoms.*

Limneria fuscicarpus, Thomson, Opusc. Ent. xi, 1887, p. 1104 (♂ ♀).

Eulimneria fuscicarpus, Schmiedeknecht, Opusc. Ichn. 1908, p. 1654 (♂ ♀).

Limnerium annulipes, Cameron MS. (♀) (*nec* Cress. 1864).

♂ ♀. An elongate, black species, with the legs, except basally, red; femora normal, the hind ones immaculate; the hind tibiæ pure white with their base and apex broadly black; hind tarsi and their calcaria black, with the base of both broadly white; longitudinal metanotal impression dull and granulose.

Length 6-7 millim.

Punjab: Simla, viii. 98 (*Col. Nurse*).

The pure white markings of the hind legs, all the trochanters and mandibles, and the black base of the hind tibiæ, render this species distinct.

I have seen only one female in Col. Nurse's collection.

375. **Limnerium forticarinatum,** *Cam.*

Limnerium forticarinatum, Cameron, Journ. Bombay Nat. Hist. Soc. 1906, p. 280 (♂).

♂. A black species, with the legs fulvous. *Head*: clypeus with dense short grey pubescence, somewhat elongate and not very broad, apically broadly rounded and basally indistinctly discrete; cheeks as long as the basal breadth of the pale flavous and apically ferruginous mandibles; palpi pale testaceous; face hardly prominent, dull and obsoletely punctate, with short and dense grey pubescence; frons and vertex very closely and finely punctate. *Antennæ* black and extending to apex of thorax, with the scape sometimes ferruginous beneath. *Thorax* dull and immaculate, closely punctate and shortly pubescent, with the notauli obsolete; metanotum basally closely punctate; basal lateral areæ indefinite; basal area entirely wanting, cariniform; areola short cordiform and subcoalescent with the excavate, closely trans-striate and entire petiolar area; spiracles quite circular. *Scutellum* black. *Abdomen* immaculate and subnitidulous, becoming pilose apically; basal segment nitidulous, smooth, with very obsolete punctation, postpetiole distinct; valvulæ large and exserted. *Legs* fulvous, with the anterior pairs a little paler; all the coxæ (except sometimes apices of anterior) and the basal joint of the hind trochanters black; hind tarsi dark with only the base paler. *Wings* hyaline, with the radix and tegulæ stramineous, stigma and nervures dark; areolet distinctly petiolate and somewhat small, subquadrate, emitting the straight recurrent nervure from distinctly a little beyond its centre; basal nervure continuous.

Length 6–7 millim.

Baluchistan: Quetta, viii. 03 and iii. 04 (*Col. Nurse*).

Type in Col. Nurse's collection.

Besides the shape of the metanotal spiracles, this species is said to differ from *L. quettaense* in the petiole of the areolet being thickened and fully as long as the internal submarginal nervure, the anterior coxæ at least basally black, and the metanotal petiolar area more closely and regularly trans-striate. From *L. parvicarinatum* it differs in having the metanotum distinctly areated and the basal nervure continuous.

I have seen only two males.

376. **Limnerium quettaense,** *Cam.*

(?) *Campoplex xanthostoma,* Gravenhorst, Ichn. Europ. iii, p. 460 (♂); *cf.* Thomson, Opusc. Ent. xi, 1887, p. 1107 (♂ ♀).
Limnerium quettaense, Cameron, Journ. Bombay Nat. Hist. Soc. 1906, p. 280 (♂ ♀).

♂. A black species, with the legs fulvous. *Head* with the clypeus broad, apically broadly rounded and basally indistinctly

discrete, with dense long grey pubescence; palpi testaceous red; mandibles pale flavous, with their apices brilliant sanguineous; face a little prominent, dull and obsoletely punctate, with long dense grey pubescence; frons and vertex closely and very finely punctate. *Antennæ* black; in ♂ extending to apex of basal segment. *Thorax* immaculate, dull, closely punctate and shortly pilose, with the notauli obsolete; metanotum basally closely punctate; basal lateral areæ indefinite; basal area small and subquadrate, with stout and nitidulous carinæ; areola coalescent with the petiolar area, unusually excavate, strongly but not closely trans-striate, with the lateral area more strongly and irregularly striate; spiracles oval and distinctly broader than long. *Scutellum* black. *Abdomen* glabrous, nitidulous and immaculate; basal segment nitidulous, smooth, with very obsolete punctation, postpetiole distinct; ♂ valvulæ large and exserted. *Legs* bright fulvous, the anterior pairs not paler; hind coxæ and basal joint of their trochanters black; posterior tarsi, except basally, dark, with the base of all the joints a little paler. *Wings* hyaline, with the tegulæ pure white, nervures blackish and the stigma ferruginous; areolet distinctly petiolate and somewhat large, triangular, widened apically and emitting the incurved recurrent nervure from its centre; basal nervure continuous.

Fig. 139.
Limnerium quettæense, Cam.

Length 7–8 millim.

♀. Differs in its black mandibles, with much shorter teeth, convex scutellum and duller metanotum, with less distinct carinæ.

BALUCHISTAN: Quetta, v. and vi. 02 (*Col. Nurse*, types); PUNJAB: Kangra Valley, 4500 ft., iv. 99 (*G. C. Dudgeon*), Simla, 7000 ft., iv. 07, and Kasauli, 6300 ft., v. 08 (*N. Annandale*); SIKKIM: Darjiling, 6000 ft., ix. 08 (*E. Brunetti*—Ind. Mus.).

Type ♂ in Col. Nurse's collection; type ♀ in the British Museum.

This species is said to differ from *L. forticarinatum* in having the petiole of the areolet only half the length of its internal nervure, the anterior coxæ and trochanters not black-marked and the metanotal petiolar area less closely and regularly striate; from *L. parvicarinatum* the ♂ differs in having the metanotum more or less distinctly areated and the basal nervure continuous. I am by no means convinced, however, that Cameron's sexes are conspecific, though superficially similar and belonging to the genus *Limneria*, *sensu* Thoms.; it is closely allied to, and very possibly synonymous with, *Campoplex xanthostoma*, Grav., which I do not know in nature.

377. **Limnerium crassifemur**, *Thoms.*

Limneria crassifemur, Thomson, Opusc. Ent. xi, 1887, p. 1106 (♂ ♀).
Eulimneria crassifemur, Schmiedeknecht, Ichn. Opusc. 1908, p. 1657 (♂ ♀).
Limnerium longiventre, Cameron MS.

♂ ♀. An elongate, black species, with the legs, except basally, red; femora distinctly stout and the hind ones apically black; hind tibiæ testaceous, with their apices and a band before the base black; hind tarsi dark; longitudinal metanotal impression nitidulous; petiole with its lateral foveæ deep.

Length 6–9 millim.

PUNJAB: Simla, ix. 98 (*Col. Nurse*); CEYLON: Matale, vii. and viii. 01 (*E. E. Green*). EUROPE.

This species belongs to a very closely allied group, but its author says that it may be recognised by the shining and subglabrous metanotal areola, the distinctly close punctation of the mesopleuræ, the strongly buccate cheeks, longer and stouter mandibles, apically subrotund clypeus and the distinctly dilated ♂ vertex.

This insect is known to occur in Sweden and Germany, but its distribution is doubtless very much wider and the present will probably prove to be only the first of many distant records. Mr. Green has bred three analogous females from larvæ of an unknown species of *Psyche* at Matale.

378. **Limnerium volens**, *Cam.*

Limneria volens, Cameron,* Manch. Mem. 1899, p. 126 (♀).

♀. A black species, with the legs and abdomen, except basally, red. *Head* with the face and clypeus coarsely shagreened, with short white pubescence; frons and vertex dull; palpi and mandibles stramineous, with apices of the latter black. *Antennæ* black, with pale pubescence, and slightly thickened towards their apices. *Thorax* dull and immaculate; metanotum coarsely shagreened, basally elevated and distinctly discrete from the postscutellum, the curved carina widely separated from the base, and, behind it, an interrupted, longitudinal one; the carina bordering the apex indistinct at the top; pleuræ with white pubescence; propleuræ coarsely shagreened and not excavate, broadly elevated basally and strongly trans-striate centrally below; mesopleuræ, except centrally, strongly aciculate, with the base curved and distinctly margined below; mesosternum obliquely sulcate before the intermediate coxæ; metapleuræ coarsely aciculate and basally shortly impressed below the spiracles. *Postscutellum* circularly foveolate and longitudinally striate on either side. *Abdomen* red, with the first segment and the disc of the second, except apically, black; venter flavous; terebral valvulæ black. *Legs* fulvous;

anterior coxæ and trochanters flavous; hind coxæ and base of their trochanters above black, with their tarsi infuscate. *Wings* clear hyaline; stigma testaceous or fuscous, and the nervures

Fig. 140.—*Limnerium volens*, Cam.

paler; areolet small and shortly petiolate, emitting the recurrent nervure from its apical third; lower half of second transverse cubital nervure broadly fenestrate.

Length 7 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

This species is said by Cameron to be closely related to *L. indica*, which differs from it in being larger, in having the anterior coxæ black, with only their apices pale, the second segment immaculate, no apical carina on the metanotum and the areolet more elongately petiolate.

379. **Limnerium renovatum**, nom. nov.

Limnerium erythropus, Cameron* (*nec* Ashm.), Entom. 1906, p. 249 (♀).

♀. A black species, with the legs mainly red. *Head* with the mandibles and palpi flavous. *Metathorax* more strongly and rugosely punctate than the remainder; metanotum with the areæ obsolete, the petiolar area longer than broad with parallel sides and not very distinct, lateral areæ large and semicircular, spiracular areæ substriate; propleuræ strongly striate apically on their lower two-thirds. *Abdomen* immaculate, with the terebra ½ millim. in length. *Legs* red, with the hind coxæ black and the anterior

trochanters flavous; hind tarsi dark. *Wings* hyaline, with the tegulæ flavous, the stigma and nervures black; areolet quadrangular, with the sides coalescent above, emitting the recurrent nervure shortly beyond its centre.

Length 5 millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

380. **Limnerium indicum,** *Cam.*

Limneria indica, Cameron,* Manch. Mem. 1899, p. 125 (♀).

♀. A black species, with the abdomen and legs, except basally, red. *Head* with the face closely, but not strongly, punctate and with dense silvery pubescence; mandibles and palpi flavous, the former apically blackish; lower side of vertex faintly transaciculate close to the eyes. *Antennæ* black, with dense white pubescence, and the scape flavidous apically beneath. *Thorax* immaculate and with sparse white pubescence; metathorax

Fig. 141.—*Limnerium indicum*, Cam.

densely pubescent, closely punctate, with the base smoother, and keeled down the middle, and, from the apex of this central keel, run two curved keels, which do not curve backwards to the base of the segment; below the spiracle is a curved keel, straight and oblique at the base, curved towards the apex of the segment; base of propleuræ, and their apex above, closely striate; mesopleuræ closely punctate and shallowly impressed centrally above. *Abdomen* ferruginous, with the basal segment, except at its apex, black; venter flavidous; terebral valvulæ black. *Legs* fulvous;

all the coxæ black, with their apices, like the anterior trochanters, stramineous; hind legs red, with their tibiæ sparsely spinose and the tarsi dark. *Wings* hyaline or infuscate-hyaline; nervures dark and the stigma slightly darker; areolet oblique, small and shortly petiolate, emitting the recurrent nervure shortly beyond its centre.

Length 7 millim.

ASSAM: Khasi Hills (*Rothney*).

Type in the Oxford Museum.

381. **Limnerium himalayense**, *Cam.*

Limnerium himalayense, Cameron, Entom. 1906, p. 249 (♀).

♂ ♀. A dull, granulate, black species, with sparse white pubescence and red legs. *Head* with the palpi and mandibles (except their teeth) flavous. *Antennæ* densely and very shortly pubescent. *Metathorax* with longer and closer white pubescence, its notum more strongly sculptured and exareolate, with but indications of basal carinæ; petiolar region obscurely trans-striate; mesopleuræ obscurely punctate-sulcate obliquely below their centre. *Abdomen* immaculate, with the terebra about ½ millim. in length. *Legs* red, with the anterior trochanters flavous; anterior coxæ (except their flavous apices) and the ♀ posterior trochanters black; hind tarsi and apices of their tibiæ in ♀ blackish; tibiæ distinctly spinulose and basally constricted, with white calcaria. *Wings* hyaline, with the tegulæ flavous, the stigma infuscate and nervures darker; areolet oblique and distinctly petiolate, emitting the recurrent nervure from shortly beyond its centre; space between this recurrent and the second transverse cubital nervure as long as the pedicle.

Length 5–6½ millim.

PUNJAB: Simla, viii. 98 (*Col. Nurse*); UNITED PROVINCES: Dehra Dun, iv. 10 (*Dr. A. D. Imms*).

Type in Col. Nurse's collection.

382. **Limnerium agraense**, *Cam.*

Limneria agraensis, Cameron,* Manch. Mem. 1897, p. 29 (♀).

♀. *Head* alutaceous and, except on the vertex, with dense white pubescence; mandibles testaceous, with pale pilosity and the teeth black; palpi flavous. *Antennæ* black. *Thorax* black, closely punctate, with dense white pilosity; mesopleuræ trans-striate centrally, with the speculum smooth; areola longer than broad and not small, the apex of the apical area entering into it as an acute angle; there is a short, stout, oblique carina outside the spiracles, beyond which it curves round to the apex of the segment, but is much thinner than the basal branch. *Abdomen* black, with

the second and third segments pale testaceous beneath, and apically dull red above; postpetiole with an elongate basal area; terebra 3 millim. in length. *Legs* rufescent, with the base of the

Fig. 142.—*Limnerium agraense*, Cam.

front ones flavous; the pubescent hind tarsi and apices of their tibiæ black; calcaria stramineous. *Wings* clear hyaline; stigma and nervures dark testaceous; tegulæ flavous.

Length 7–8 millim.

UNITED PROVINCES; Agra (*Rothney*).

Type in the Oxford Museum.

383. **Limnerium taprobanicum**, *Cam.*

Limnerium taprobanicum, Cameron, Spolia Zeylanica, 1905, p. 128 (♀).

♀. A dull, black species with the legs mainly red. *Head* dull, finely and closely punctate, and with white pubescence; mandibles and palpi pale testaceous. *Antennæ* immaculate. *Thorax* dull, finely and closely punctate, with white pubescence; in the centre of the base of the metanotum is a clearly defined area about three times as long as wide and of equal width throughout; "from the apex of this run two keels; they are at the base roundly curved outwardly, then run obliquely to the outer side of the apical slope, uniting with the pleural keel above the middle of the coxæ"; propleuræ closely, obliquely and somewhat strongly striate. *Abdomen* entirely black. *Legs*: anterior pair dark rufescent, with the coxæ basally black and the trochanters pale

flavous; hind legs ferruginous with their tarsi, coxæ, base of trochanters and apices of tibiæ, black. *Wings* hyaline, with the nervures blackish and the stigma paler below; areolet shortly petiolate, quadrate and as broad as long, emitting the recurrent nervure from its centre.

Length 6 millim.

CEYLON: Maskeliya (*E. E. Green*).

384. **Limnerium parvicarinatum**, *Cam.*

Limnerium parvicarinatum, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 281 (♂).

♂. A black species, with the legs mainly rufescent. *Head*: clypeus with dense short grey pubescence, somewhat short and broad, apically broadly rounded and basally indistinctly discrete; palpi white; mandibles missing; face hardly prominent, dull and obsoletely punctate, with short dense pubescence; frons and vertex very closely and finely punctate. *Antennæ* black and extending to the basal segment, with the scape fulvidous beneath. *Thorax* very dull and immaculate, closely punctate and with short brown pubescence, the notauli wanting; metanotum basally closely punctate; basal lateral areæ and basal area wanting; areola entirely coalescent with the subexcavate, scabriculous and hardly trans-striate petiolar area, which is without lateral carinæ; spiracles quite circular. *Scutellum* black. *Abdomen* immaculate and subnitidulous, broadest behind its centre and becoming pilose apically; basal segment nitidulous, smooth and very obsoletely punctate, postpetiole not abruptly widened; valvulæ exserted and somewhat large. *Legs* fulvous, with the anterior pairs paler, and the anterior tibiæ and tarsi white; all coxæ (except apices of front ones) and basal joint of hind trochanters black; hind tarsi dark, with only the base of all their joints paler, their fulvous tibiæ distinctly paler at apex and indistinctly before their base. *Wings* hyaline, with the tegulæ and radix dull stramineous, the stigma and nervures dark; areolet distinctly petiolate and somewhat small, triangular, emitting the straight recurrent nervure from slightly beyond its centre; basal nervure not continuous.

Length 7 millim.

BALUCHISTAN: Quetta, vi. 02 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species differs from both *L. quettaense* and *L. forticarinatum* in having the basal nervure not continuous through the median and the metanotum with only the base and sides of the areola at all distinctly carinate. The type has entirely lost its mandibles; I consider it is extremely improbable that they should be black, as described by Cameron.

A single male was captured at Quetta, in Baluchistan, during June 1902.

385. **Limnerium morosum**, *Cam.*

Limneria morosa, Cameron, Manch. Mem. 1897, p. 30 (♀).

♀. A black species, with the legs and apices of the abdominal segments pale red. *Head* closely punctate, black, with the palpi and mandibles white; face with dense white pubescence. *Antennæ* black throughout, with dense and very short pale pubescence. *Thorax* immaculate, shagreened, dull, with sparse short pale pubescence; metanotum with three distinct basal areæ, remainder obsolete, and its apex finely trans-aciculate. *Abdomen* black, with all the segments broadly rufo-testaceous laterally and apically; the first segment immaculate and shagreened, with its "base" flat, nitidulous and very smooth; venter flavidous-testaceous. *Legs* pale testaceous, with all the femora rufescent; coxæ black, with the anterior pairs apically testaceous; hind tarsi and apices of their tibiæ dark. *Wings* hyaline; tegulæ white, stigma testaceous below, areolet distinctly petiolate.

Length 5 millim.

CEYLON: Trincomali (*Col. Yerbury*).

386. **Limnerium ceylonicum**, *Cam.*

Limneria ceylonica, Cameron,* Manch. Mem. 1897, p. 28 (♂).

♂. A black species, with the abdomen broadly, and legs partly, red. *Head* very closely and somewhat strongly punctate throughout; face not sparsely white-pubescent; mandibles, except basally, ferruginous and the palpi testaceous, becoming apically paler. *Antennæ* entirely black, with very short pubescence. *Thorax* alutaceous and immaculate, with dense white pilosity throughout; metanotum gradually and subconvexly sloping; propleuræ nitidulous and obliquely strigose, more strongly basally; mesopleuræ punctate and above centrally trans-aciculate; metapleuræ alutaceous. *Abdomen* red, with the first segment entirely black, and the second also black, except the apex above and a mark on the side which are rufous. *Legs*: front pair fulvous, with the apices of their black coxæ white; the intermediate femora apically, and their tibiæ basally, rufescent; calcaria pale. *Wings* clear hyaline, subinfumate apically; stigma black; areolet shortly petiolate, with its lateral nervures slightly curved and its lower margin sharply angled centrally.

Length 7–8 millim.

CEYLON (*Rothney*).

Type in the Oxford Museum.

This male would be, perhaps, more correctly placed in the genus *Campoplex*, where the entirely black hind legs ally it to *C. lapponicus*.

Genus IDECHTHIS, *Först.*

Idechthis, Förster, Verh. pr. Rheinl. 1868, p. 154.

Genotype, not cited.

Head transverse and not broad; clypeus apically very broadly rounded and not produced; eyes internally parallel and not emarginate; metanotum striate and not rugose, with the petiolar area not excavate; spiracles small and circular: abdomen with the spiracles of second segment very distinctly beyond its centre; terebra not extending beyond anus; hind calcaria shorter than second joint of their tarsi; areolet entire and pentagonal, with the radius angled above it; anal nervure emitted exactly from centre of first recurrent; nervellus straight and not intercepted; basal abscissa of radius in hind wings shorter than their recurrent nervure.

Range. Palæarctic Region.

It is very improbable that the genus *Lathrostizus*, Först., is distinct from the present one; my diagnosis above includes the characters of both, since they are combined in the species herein comprised. Cameron incorrectly placed his species in *Tranosema*, Först. (Verh. pr. Rheinl. 1868, p. 157), with considerable doubt; but it differs from it in having the second segmental spiracles distinctly behind the centre.

387. Idechthis striata, *Cam.*

Tranosema? striata, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 276 (♀).
Tranosema? spilostoma, Cameron,* *op. cit.* p. 277 (♀).

♀. A black and nitidulous species, with the legs pale. *Head* not cubical; clypeus smooth and nitidulous, basally not discrete,

Fig. 143.—*Idechthis striata*, Cam.

apically red and broadly rounded, laterally foveate and subreflexed; face strongly nitidulous and obsoletely trans-aciculate;

eyes coarsely facetted and internally quite parallel; cheeks short and hardly longer than the antennal pedicle; frons and vertex aciculate; ocelli prominent and remote, much further from one another than from the eyes; mandibles, usually excepting apices, flavous; palpi pale testaceous and basally black. *Antennæ* filiform, slender and immaculate, shorter than the body. *Metanotum* irregularly and somewhat strongly striate and subpunctate; areola distinct, more than twice as long as broad and obliquely constricted basally; petiolar area not excavate, twice as long as broad, carinate throughout, nitidulous and apically constricted; spiracles small and circular; upper two-thirds of propleuræ and basal half of mesopleuræ, except below the centre, closely aciculate. *Scutellum* convex and black. *Abdomen* smooth and hardly compressed, centrally but little broader than the thorax, pilose, with apices of all the segments somewhat indeterminately fulvous; basal segment elongate and longer than second, with postpetiole distinct and dilated, centrally closely aciculate, its spiracles close to centre; spiracles of second segment very distinctly beyond the centre; hypopygium obtusely exserted; terebra not extending beyond the anus, with the valvulæ broad and stout. *Legs* slender and fulvous, with the coxæ and base of trochanters black; hind trochanters apically red or stramineous; apices of femora, and anterior tibiæ, flavidous; hind calcaria shorter than their second tarsal joint. *Wings* very ample and remarkably clear hyaline, with the costa and the somewhat large stigma pale testaceous, and the nervures black; tegulæ stramineous, pterostigma incrassate and rounded behind; areolct entire, triangular, narrowed and more or less coalesced above, emitting the recurrent nervure from its centre; basal nervure continuous; radial cell somewhat short and broad, angled above the areolet; apical nervures of the hind wings pellucid.

Length 6 millim.

BALUCHISTAN: Peshin, iv. 03 (*Col. Nurse*).

Type in Col. Nurses' collection.

The small distinctions upon which Cameron differentiated his second species are not at all obvious, the clypeus is distinctly red apically in both, and an examination of both the types has convinced me that they are specifically identical.

Genus **ANILASTA**, *Thomson.*

(?) *Anilastus*, Förster, Verh. pr. Rheinl. 1868, p. 157.
Anilasta, Thomson, Opusc. Ent. xi, 1887, p. 1168.

GENOTYPE, *Campoplex ebeninus*, Grav.

Head anteriorly triangular; checks somewhat elongate, not buccate, with the genal costa inflexed; clypeus convex and apically rounded, with small lateral foveæ; mandibles narrowed apically, with the teeth subequal; eyes slightly emarginate next the scrobes. Antennal flagellum usually stout and elongate,

apically attenuate. Thorax not cylindrical, higher than long, with the mesosternum nearly always transverse and the metanotal carinæ distinct; areola usually transverse and angled. First abdominal segment with the glymmal sulci distinct, and the subquadrate postpetiole obviously broader; second segment not or hardly longer than the third, and not transverse; seventh rarely incised in ♀ and the terebra either hardly exserted or a little longer than the basal segment, with dilated valvulæ. Legs not stout, with the tarsal claws pectinate. Wings with the stigma not broad; areolet nearly always irregular, small and petiolate; radial cell sublanceolate and the second discoidal apically acute; anal nervure emitted from the centre of the brachial cell; nervellus neither oblique nor geniculate.

Range. Palæarctic Region, Himalayas, Ceylon.

Table of Species.

1 (2) Abdomen entirely black; basal metanotal area not petiolate	*ebenina*, Grav., p. 494.
2 (1) Abdomen broadly red; basal metanotal area petiolate.	
3 (4) Costulæ wanting; hind tibiæ not basally black	*simlaensis*, Cam., p. 495.
4 (3) Costulæ entire; hind tibiæ basally black	*varicoxa*, Thoms., p. 496.

388. **Anilasta ebenina**, *Grav.*

Campoplex ebeninus, Gravenhorst, Ichn. Europ. iii, 1829, p. 480 (♂ ♀) (*partim*).
Limneria melanaria, Holmgren, Sv. Ak. Handl. 1854, p. 37.
Campoplex melanarius, Holmgren, *op. cit.* 1858, p. 37; Förster, Verh. z.-b. Ges. 1868, p. 872 (♂ ♀).
Anilasta ebenina, Thomson, Opusc. Ent. xi, 1887, p. 1170 (♂ ♀).

♂ ♀. A pilose, black species, with the legs, except basally, alone red. *Head* with the vertex broad, and but slightly constricted behind the internally subemarginate eyes; clypeus apically rounded and simple; palpi and mandibles pale, with the teeth subequal. *Antennæ* not very slender. *Thorax* immaculate, with the areola hexagonal, not longer than broad and emitting distinct costulæ a little beyond its centre; basal area not small; spiracles circular. *Abdomen* entirely black, with the postpetiole somewhat widened and the apices of the segments nitidulous; terebra distinctly exserted. *Legs* clear red, with the anterior coxæ and trochanters sometimes paler, and the hind ones black; hind tibiæ externally spinulose and hardly darker apically. *Wings* hyaline, with the tegulæ white and the areolet petiolate.

Length 6–7 millim.

Kashmir, 8000–9000 ft. (*Col. Nurse*); Assam: Shillong, 6000 ft., iv and vi. 03 (*Rowland Turner*). Europe.

Type in the Breslau Museum.

389. **Anilasta simlaensis**, *Cam.*

Limneria simlaensis, Cameron,* Zeits. Hym.-Dipt. v, 1905, p. 283 (♀, as ♂).

♀. A black species, with the abdomen broadly and the legs red, the base of the latter flavous. *Head* black, with the palpi and mandibles pale flavous and the apices of the latter red: face and clypeus dull, finely and closely punctate and densely pilose, the alutaceous frons and vertex sparsely pilose. *Antennæ* black. *Thorax* alutaceous; metanotum closely punctate and distinctly trans-bicarinate, the basal carina united to the base of the segment by a keel which bifurcates at the base; apical slope closely and irregularly reticulate; pleuræ coarsely alutaceous, with the propleuræ closely striate; mesopleuræ with the oblique central impression distinctly striate above. *Scutellum* closely and distinctly punctate. *Abdomen* black, with the second and third segments apically, the fourth basally, and the remainder almost entirely, red; venter red, with its base subflavidous. *Legs* red, with the hind ones darker; coxæ and trochanters pale flavidous, the hind ones broadly externally and basally, their tarsi and apices of their tibiæ, black. *Wings* clear hyaline, with nervures and stigma black; areolet small, oblique and shorter than its petiole.

Fig. 144.
Anilasta simlaensis, Cam.

Length 7 millim.

KASHMIR, 6000 ft., v. 01 (*Col. Nurse*); PUNJAB: Simla, viii. 98 (*Col. Nurse*, type).

Type in Col. Nurse's collection.

This species belongs to Thomson's genus *Anilasta*; it has the anterior coxæ and trochanters entirely, and the hind coxæ only above, stramineous; the metanotum is dull, granulate and not longitudinally impressed, the areola is subquadrate, not longer than broad, hardly discrete from the petiolar area and emits the costulæ almost from its base, the basal area is extremely narrow and subparallel-sided and the spiracles circular; the hind femora and tibiæ are red with the latter hardly darker at both extremities, the nervellus is not geniculate; the basal nervure slightly postfurcal; the second discoidal cell apically acute and the anal nervure intercepts the brachial cell at its centre; the terebra is very slightly exserted.

The Kashmir specimen differs from the type only in its rather smaller size and entirely black coxæ.

390. **Anilasta varicoxa**, *Thoms.*

Anilasta varicoxa, Thomson, Opusc. Ent. xi, 1887, p. 1173 (♂ ♀).

♂ ♀. A black species, with the abdomen and legs mainly red, the mouth and tegulæ white, and the metanotal costulæ strong. *Head* very strongly constricted behind the prominent eyes; face with white pubescence; mandibles not basally reflexed below, small and white, with the palpi concolorous. *Antennæ* with the flagellum elongate and the scape not pale beneath. *Thorax* pilose; antespecular striæ nitidulous; metanotal costulæ strong; areola laterally entire, basal area narrow and petiolate; spiracles circular. *Abdomen* dull red, with the two basal segments (except apical angles of the second), and the base of the third discally, black; terebra black and not extending beyond the anus. *Legs* red, with the coxæ (excepting front ones beneath and apices of the intermediate), the hind tarsi, and both extremities of their tibiæ, black. *Wings* with the tegulæ white; areolet oblique, small and not as long as its petiole; apical abscissa of radial nervure elongate; nervellus not intercepted.

Length 6 millim.

Ceylon: Madulsima, xi. 08 (*T. Bainbrigge Fletcher*).

The Ceylon female agrees so perfectly with Thomson's somewhat short diagnosis that I have but little hesitation in ascribing it to that species.

Genus **ANGITIA**, *Holmg.*

Angitia, Holmgren, Öfv. Sv. Ak. Förh. 1858, p. 327; id., Sv. Ak. Handl. 1858, no. 8, p. 106.

Genotype, *Limneria fenestralis*, Holmg.

Head not cubical; cheeks neither elongate nor buccate, with their costæ inflexed; clypeus apically simple, with small lateral foveæ; mandibles not stout, narrowed towards the subequal apical teeth. Antennal flagellum usually filiform; scape small and often white beneath. Thorax cylindrical, with the mesosternum not transverse; propleuræ not or hardly aciculate; metathoracic carinæ distinct, areola confluent with the not transversely rugose petiolar area, costulæ strong, basal area small and triangular; spiracles circular. Abdomen with the glymmal sulci of basal segment distinct and the postpetiole somewhat widened; second segment longer than the third, with the thyridii usually obsolete; seventh segment of ♀ often excised; terebra reflexed and about half the length of the abdomen. Legs not stout; hind tibiæ often infuscate at apex and before base, hardly externally spinulose; tarsal claws subpectinate; trochanters usually pale. Wings with the tegulæ always, and the stigma usually, pale; areola as a rule small, petiolate and emitting the recurrent

nervure beyond its centre; second discoidal cell broader apically, with its lower angle acute; nervellus neither oblique nor geniculate.

Range. Palæarctic Region, India.

391. **Angitia fenestralis**, *Holmg.*

Campoplex majalis, var. 4, Gravenhorst, Ichn. Europ. iii, 1829, p. 464 (♀).
Limneria fenestralis, Holmgren, Sv. Ak. Handl. 1858, n. 8, p. 59; Brischke, Schr. Nat. Ges. Danz. 1880, p. 150; Bridgman & Fitch, Entom. 1885, p. 108 (♂ ♀).
Angitia fenestralis, Thomson, Opusc. Ent. xi, 1887, p. 1156 (♂ ♀).

♂ ♀. A sublinear, black species, with the slender femora and tibiæ red; hind femora more or less infuscate, and their tibiæ blackish at the apex and before their white base; wings with stramineous stigma and the apically curved external radial abscissa a little longer than the basal. *Head* narrowed posteriorly, with the cheeks somewhat elongate, and both mandibles and palpi white. *Antennæ* longer than half the body; scape pale beneath. *Thorax* immaculate, with the metanotal carinæ distinct; areola subhexagonal, apically incomplete and emitting the distinct costulæ from its centre; basal area not small and the spiracles circular. *Abdomen* black, with the reflexed terebra half its length. *Legs* with the anterior trochanters stramineous. *Wings* with the areolet subregular and emitting the recurrent nervure from, or from but slightly beyond, its centre.

Fig. 145.—*Angitia fenestralis*, Holmg.

Length 5 millim.

Punjab: Lyallpur (Pusa coll.); Rajputana: Mt. Abu (*Col. Nurse*).

Type in the Stockholm Museum.

The female in the Pusa collection was bred from the Tineid moth, *Plutella maculipennis*, Curt., and in Europe it has been raised from Tineids, Tortricids and Pyralids.

Tribe *CREMASTIDES.*

This tribe differs from the Pristomerides, to which its facies closely allies it, in possessing no femoral tooth or areolet; from the Porizonides in having the submarginal nervure unusually elongate instead of subobsolete and the radius not quite right-

angled above it; and from the PLECTISCIDES * in the tibiæ not being basally constricted and the head being as broad as the thorax. Only four genera are known, with widely distributed species.

Table of Genera.

1 (2) Recurrent nervure emitted beyond the submarginal; metanotum not apically produced	CREMASTUS, Grav., [p. 498.
2 (1) Recurrent nervure continuous with the submarginal; metanotum apically produced	TARYTIA, Cam., p. 502.

Genus CREMASTUS, *Grav.*

Cremastus, Gravenhorst, Ichn. Europ. iii, 1829, p. 730.
Paurolexis, Cameron, Journ. Bombay Nat. Hist. Soc. 1906, p. 282.

GENOTYPE, *C. interruptor*, Grav.

Head transverse, broadly rounded posteriorly and not very narrow; clypeus apically somewhat abruptly rounded, margined, somewhat distinctly discrete centrally and obliquely sulcate laterally; eyes glabrous and large, not or hardly emarginate internally; cheeks elongate and not sulcate; lower mandibular tooth distinctly a little the longer; scrobes very large and aciculate, extending nearly to the ocelli. Antennæ slender. Notauli rarely deeply impressed; mesopleuræ sometimes crenulately sulcate above the centre; metanotum convex and completely areated; areola twice as long as broad, basally subacuminate and apically truncate; petiolar area not or hardly excavate; apex sometimes produced above the hind coxæ; spiracles circular and small. Abdomen slender, alutaceous and more or less strongly compressed; first segment elongate with the basal third petiolate and the apex dilated; second twice as long as broad, often finely aciculate; terebra elongately exserted. Tarsal claws simple; basal hind tarsal joint about as long as the three following united; front tarsi double the length of their tibiæ; hind tibiæ a little curved but not basally constricted, with their femora not dentate. Wings not ample, all the nervures apically obsolete, and the front ones with no areolet; second recurrent emitted immediately beyond, and not much longer than, the submarginal; radial cell short, not extending beyond centre of metacarpus; stigma broad and subtriangular, emitting the radius from its centre; external cubital and anal nervures wanting, basal subcontinuous; first discoidal cell much broader basally than apically, and short; nervellus straight and not intercepted, its median nervure wanting thence to base.

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* Respecting the PLECTISCIDES, it is sufficient in the present state of our knowledge to say that doubtless this tribe is very numerously represented in India, whence I have seen a female collected in Ceylon by Dr. Thwaites, in 1867; &c., &c.; but so little attention has at present been paid to the collecting of these small species that an account of them is held over for the present.

Range. World-wide.

Cameron was of opinion that his genus belonged to the Campoplegides, wherein he wished to place it near *Zaporus*, but it is distinct from that tribe in its very short and nearly right-angled radial cell in the front wings, and the basally wanting median nervure in the hind wings; the latter feature is shared with the Porizonides, which differ in having a much shorter submarginal nervure and the basal superiorly incrassate at the pterostigma. Cameron's diagnosis of *Paurolexis* will be found to coincide very well with that of *Cremastus*, Grav., as given by Thomson (Opusc. Ent. xiv, p. 1441).

Table of Species.

1 (2) Red; metathoracic areola four times as long as broad	*pestifer*, sp. n., p. 499.
2 (1) Flavous; areola at most twice as long as broad.	
3 (4) Second segment not aciculate; abdomen with black bands	*flavus*, Cam., p. 500.
4 (3) Second segment strongly aciculate; abdomen discally black	*noxiosus*, sp. n., p. 501.

392. **Cremastus pestifer**, sp. n.

♀. A bright red species, with the head, thorax and part of the abdomen, discally black. *Head* with the frons, vertex and occiput centrally, and the mandibular apices, black; frons and vertex closely and finely punctate, scrobes large but not deeply impressed; face transverse and a little convex, with epistoma prominent and the apically subtruncate clypeus basally strongly discrete. *Antennæ* as long as the body, very slender and black, with the scape and flagellar base testaceous beneath. *Thorax* elongate and deplanate, much longer than high, red, with three broad stripes on the finely and distinctly punctate mesonotum, the frenum, scutellar sulcus, and the whole disc of the finely sculptured metathorax, black; metanotal areæ very distinct; basal areæ elongate and triangular; areola four times as long as its width at the basal fourth, whence the strong costulæ are emitted, and not distinctly discrete from the basally acuminate and apically parallel-sided petiolar area, which extends far above the hind coxæ. *Scutellum* deplanate, red and finely punctate.

Fig. 146.—*Cremastus pestifer*, Morl.

Abdomen sublinear, with the aciculate second segment not broader than the third and distinctly longer than the first; basal segment parallel-sided to its centre and thence very gradually widened to the apex, which is about one-third as broad as its total length and very finely aciculate; base of first two segments broadly, and of all the remainder narrowly, determinately black; terebra black and about half the length of the abdomen. *Legs* pale fulvous, with the coxæ substramineous; hind tibiæ testaceous, with the base and apex blackish. *Wings* broad but not ample; radix and tegulæ dull testaceous, the stigma and nervures ferruginous; radial cell short and apically subreflexed; submarginal nervure longer than half the recurrent, which is emitted closely beyond it; basal nervure continuous; nervellus postfurcal, and subgeniculate centrally but not intercepted.

Length 8 millim.

CEYLON: Weligama, i. 08 (*T. Bainbrigge Fletcher*, type), Kurunegalla, i. 10 (*G. G. Gilpin Brown*).

Type in the author's collection.

This species has much the facies of *Tarytia flavo-orbitalis*, but differs to an appreciable extent both in colour and sculpture; the black base of the bright red abdominal segments is distinctive.

393. **Cremastus flavus**, *Cam.*

Paurolexis flavus, Cameron,* Journ. Bombay Nat. Hist. Soc. 1906, p. 283 (♀).

♀. A pale flavous species with the mandibular teeth, scrobes, ocelli, three mesonotal stripes, basal metanotal area, prosternal and mesopleural spots, mesosternal and metapleural lines, scutellar fovea, and frenum laterally, base of all the abdominal segments and centre of the first two, basal segment beneath, terebral valvulæ, base of hind femora and of both their trochanteral joints narrowly, black. *Antennæ* extending to near apex of basal segment, filiform, with the flagellum ferruginous, becoming basally infuscate. *Metanotum* strongly nitidulous, obsoletely punctate and pilose, with the complete areæ very finely delineated; areola twice as long as broad. *Scutellum* evenly and somewhat strongly convex, and nitidulous throughout. *Abdomen* with the apical segments rufescent basally, and apically glaucous white; terebra about three-fourths the abdominal length. *Legs*: hind pair not longer than the abdomen, with the apical half of their tibiæ infuscate beneath and a small dark spot before the base. Stigma flavous, with its apex ferruginous beneath.

Length $8\frac{1}{2}$ millim.

BALUCHISTAN: Quetta, vi. 03 (*Col. Nurse*).

Type in Col. Nurse's Collection.

All the species described by Thomson (Opusc. Ent. xiv, p. 1444) are mainly black, but the present one is most closely allied in the conformation of its glymmal sulci to *C. signatus*, Holmg. (Sv. Ak.

Handl. 1858, p. 108). Van Vollenhoven described a ♂ of this genus under the name *C. balteatus* in 1878 (Tijds. Ent. xxi, p. 168, pl. x, fig. 6), from Breda, which Dalla Torre (Cat. Hym. iii. p. 33) has erroneously rendered Batavia, in Java.

394. **Cremastus noxiosus**, sp. n.

♂ ♀. A bright flavous species with profuse black markings. *Head* flavous, with the mandibular apices and interocellar space black; frons and vertex finely punctate and dull, scrobes small and superficial; face transverse, dull and a little convex, with the epistoma subprominent longitudinally, and the apically sharply rounded clypeus strongly discrete basally. *Antennæ* as long as the body, very slender, dark, with the scape and flagellar base testaceous beneath. *Thorax* deplanate and somewhat elongate, red in ♂ or black in ♀, with two narrow stripes on the finely and distinctly punctate mesonotum and the preradical lines flavous; frenum and the whole disc of the metathorax black; areæ very distinct; basal area elongate and triangular; areola hardly twice as long as broad at the basal third, whence the strong costulæ are emitted, and distinctly discrete from the basally rounded and apically parallel-sided petiolar area which extends far above the hind coxæ. *Scutellum* subconvex, bright flavous and punctate. *Abdomen* discally black and ventrally flavous, linear, with the strongly aciculate second segment not broader than the base of the third, and as long as the first segment; basal segment parallel-sided to centre and thence exactly fusiform to its apex, which is hardly broader than the petiole and very finely aciculate; terebra black, very slender and about half the length of the abdomen. *Legs* testaceous, with the anterior coxæ substramineous; hind tibiæ blackish at base and apex. *Wings* broad and somewhat ample; radix and tegulæ flavescent, stigma and nervures dull ochreous; radial cell short and apically straight; submarginal nervure longer than half the recurrent, which is emitted not very closely beyond it; basal nervure continuous; nervellus opposite and neither geniculate nor intercepted.

Length 5–6 millim.

BENGAL: Pusa, i. 06 and xi. 07.

Type in the Pusa collection.

Extremely similar to the species of *Tarytia*, but at once recognised by the interception of the external cubital nervure by the second recurrent distinctly beyond the submarginal.

A unique pair of this pretty little species was bred at the Agricultural Research Institute at Pusa from the Pyralid moth, *Antigastra catalaunalis*. There, too, is a male with the occiput, antennæ, thorax and abdomen almost entirely black, rendering it superficially very distinct in appearance, though I find no structural distinctions and propose to term it var. **nigrescens**; it was bred from the hairy caterpillar of the Arctiid moth,

Diacrisia obliqua, Wlk. Paiva took a female of this species, with *Tarytia flavo-orbitalis*, on board-ship, ten miles off Coconada on the Madras coast, on 14th April 1908.

Genus **TARYTIA**, *Cam.*

Tarytia, Cameron, Journ. Bombay Nat. Hist. Soc. 1907, p. 588.

Genotype, *T. basimacula*, Cam.

Clypeus distinctly discrete from the face and apically broadly rounded; mandibles with the teeth large, divergent and of equal length; cheeks distinct and not sulcate; eyes nude, internally parallel and not emarginate. Antennæ exactly filiform and of normal length. Notauli sometimes present; metathorax not at all rugose, apically subproduced beyond base of hind coxæ; metanotum irregularly and weakly areated centrally; spiracles small and very shortly oval. Abdomen distinctly petiolate, with the spiracles far beyond centre of the basal segment, which is longer than the second, with the postpetiole distinctly nodose; ovipositor distinctly exserted, but not elongate, with filiform valvulæ. Intermediate tibiæ bicalcarate; hind calcaria nearly as long as the second tarsal joint; femora not dentate; tarsi normal, not at all spatuliform, with simple and not pectinate claws; basal joint of hind ones nearly as long as the following three united; hind coxæ stout, two and a half times as long as broad. Stigma not broad nor radial cell short; areolet entirely wanting; second recurrent nervure distinct and fenestrate above its centre, emitted at or beyond the submarginal; basal nervure continuous; parallel nervure intercepted shortly above its centre; hind wings with the nervellus neither intercepted nor geniculate, and all the nervures apically pellucid.

Range. India.

This genus does not bear the remotest relationship to *Agrypon*, with which Cameron compares it; I have not seen Szépligeti's arrangement, to which he refers, but its whole facies is entirely Cremastid. An examination of the whole of the type specimens has enabled me to draw up the following table of species, though it is possible that in some instances the two sexes have been described as distinct species since, with a single exception, all the species have been founded on single specimens.

Table of Species.

1 (8) Second recurrent nervure continuous with the submarginal.
2 (5) Notauli entirely wanting: scutellum dull and granulate.
3 (4) Second segment twice as long as broad; length $3\frac{1}{2}$ millim. . . . . *empusa*, sp. n., p. 504.
4 (3) Second segment thrice as long as broad length 7 millim. . . . . *nigromaculata*, Cam., p. 503.

5 (2) Notauli distinct; scutellum nitidulous and punctate.
6 (7) ♂ only; notauli extending to disc of mesonotum .... *cariniscutis*, Cam.,† p. 504.
7 (6) ♀ only; notauli confined to the apical declivity .... *basimacula*, Cam., p. 505.
8 (1) Second recurrent emitted distinctly beyond submarginal .... *flavo-orbitalis*, Cam., p. 506.

395. **Tarytia nigromaculata**, *Cam.*

Tarytia nigromaculata, Cameron,* Journ. Bombay Nat. Hist. Soc. 1907, p. 589 (♂).

♂. A flavidous testaceous species. *Head* flavous, with the ocellar region, two broad frontal stripes, and the centre of the occiput broadly, black; face and clypeus finely and closely punctate, frons and vertex somewhat more strongly punctate, with the frons centrally elevated and rufescent. *Antennæ* infuscate-brunneous, with the flavous scape black above. *Thorax* with the mesonotum closely and strongly punctate, laterally rufescent, with flavous stripes on either side of a broad black central stripe at the apical two-thirds; radical foveæ, and a broad and apically curved mark on basal third of metanotal disc, black; metanotum more strongly punctate, with the petiolar area closely and strongly striate; pleuræ not more finely punctate than the mesonotum, but more strongly so towards their apices. *Scutellum* closely and strongly granulate, roundly declivous throughout. *Abdomen* glabrous, dorsally rufescent, with base of first segment, basal half of the finely and closely aciculate second, and base of the third, black; basal segment abruptly dilated from its apical third; second segment thrice as long as broad. *Legs*: anterior pairs stramineous; hind ones red, with the tibiæ and tarsi darker, trochanters and coxæ stramineous; tarsi dark, hind tibiæ with a dark band before the base. *Wings* hyaline, with the stigma pale testaceous, externally darker, and the nervures paler.

Length 7 millim.

Bombay: Deesa, x. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

Very distinct from its congeners in the dull and granulate scutellum, the entire lack of any trace of the notauli, and in the continuation of the second recurrent nervure with the submarginal.

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† Mr. Green has sent me a fragment of an interesting new species ("No. 857") which he bred at Peradeniya in Ceylon, in December 1901, from a fruit of *Solanum melongela*, infested by larvæ of the Pyralid moth *Leucinodes orbonalis*. It is larger, with darker stigma, than any described *Tarytia* and approaches *T. cariniscutis* in its entire mesonotal notauli.

396. **Tarytia empusa**, sp. n.

♂. A very small, testaceous species, with the head (except ocelli), legs, second abdominal segment, tegulæ, and apex of scutellum, flavous; ocelli, antennæ, disc of metanotum, and of first and fourth segments, infuscate; basal metanotal area as long as the areola.

Length 3½ millim.

BENGAL: Pusa, ix. 06.

Type in the Pusa collection.

This species is too closely allied to *T. nigromaculata* to need a detailed description; besides its coloration and much smaller size, it differs therefrom in the metanotum being much more nitidulous, with all the areolar carinæ stouter and more clearly defined; the basal area is strongly elongate, the head less emarginate posteriorly, the postpetiole gradually dilated from its centre and not abruptly from its apical third, and the second segment is not more than twice as long as broad.

397. **Tarytia cariniscutis**, *Cam.*

Tarytia cariniscutis, Cameron,* Journ. Bombay Nat. Hist. Soc. 1907, p. 590 (♂).

♂. A clear pale testaceous species. *Head* (mutilated) with the face and clypeus closely punctate. *Antennæ* infuscate, paler below, with the scape flavous. *Thorax* closely, but not strongly, punctate; metanotum with very distinct notauli; petiolar area distinct and triangular, with the lateral carinæ broad and basally coalescent; areola feebly and sparsely striate, broad, roundly constricted basally and subconstricted towards the apex, extending to shortly beyond the centre; propleuræ glabrous. *Scutellum* closely punctate and laterally carinate to near its centre, strongest at base. *Abdomen* with the basal half of the second and third segments discally, and the latter laterally, black; anus black; second segment discally finely and closely, base of third more obsoletely, aciculate; valvulæ broad, elongate and strongly exserted. *Legs* immaculate. *Wings* clear hyaline, with the stigma and nervures pale testaceous.

Length 8 millim.

BOMBAY: Deesa, vii. 98 (*Col. Nurse*).

Type in Col. Nurse's collection.

This species is said to be recognised by the scutellum being carinate beyond its base, and by the large and distinctly defined petiolar area; from the remaining four species it differs in its elongate notauli, which extend strongly to the pin run through the disc, in its shining and not very closely punctate scutellum and in the second recurrent nervure being continuous with the submarginal.

398. **Tarytia basimacula**, *Cam.*

Tarytia basimacula, Cameron,* Journ. Bombay Nat. Hist. Soc. 1907, p. 588 (♀).

♀. A testaceous red species. *Head* flavous, with the ocellar region triangularly black; face and base of clypeus closely punctate, the latter apically glabrous; frons and vertex closely, but more strongly, punctate; scrobes elongate and deeply impressed,

Fig. 147.—*Tarytia basimacula*, Cam.

separated by a carina; eyes large and internally parallel; ocelli large and pale, with the basal pair further apart than from the eyes. *Thorax*: mesonotum closely punctate, with two broad flavescent stripes; metanotum rugosely punctate, with indistinct carinæ and the apical declivity strongly trans-striate; pleuræ closely and distinctly punctate, with the meso- and meta-pleuræ broadly fulvous basally. *Scutellum* roundly convex. *Abdomen* with the first segment basally, and the basal half of the second discally, black; anus infuscate; second segment and the postpetiole closely and distinctly aciculate; third basally substriate; terebra 2 millim. in length. *Legs* somewhat paler than the body and immaculate. *Wings* hyaline, with the stigma dark testaceous and the nervures black.

Length 8 millim.

Bombay: Deesa, x. 99 (*Col. Nurse*).

Type in Col. Nurse's collection.

I am strongly of the opinion that this is the alternate sex of *T. cariniscutis*, but since they have been described as distinct and we at present know but single examples of each species of the genus, it is better to treat them temporarily as different, more especially as the present specimen has the notauli entirely apical and not extending to the disc, while in *T. cariniscutis* they extend to the centre of the mesonotum.

399. **Tarytia flavo-orbitalis**, *Cam.*

Tarytia flavo-orbitalis, Cameron, Journ. Bombay Nat. Hist. Soc. 1907, p. 589 (♀).

♂ ♀. A slender testaceous species with only the mandibular apices, interocellar space, terebral valvulæ, the two basal abdominal segments dorsally, and the following more or less discally, black; apex and sometimes base of hind tibiæ, their tarsi and the flagellum, slightly infuscate. *Head* somewhat narrow, dull and pubescent, sometimes with the orbits distinctly flavous; scrobes large and separated by a carina; face distinctly punctate, with the epistoma elevated and the distinctly discrete clypeus sparsely punctate and apically margined; cheeks shorter than the base of the stout and equidentate mandibles. *Antennæ* filiform and extending to the apex of the postpetiole. *Thorax* closely punctate and dull, with the notauli deeply impressed; metanotal areæ fine and not very distinct; areola elongate and hexagonal, emitting costulæ before its centre; petiolar area elongate and subparallel-sided. *Scutellum* convex and not laterally margined. *Abdomen* linear, with the strongly aciculate second segment broadest; basal segment linear to its centre, thence fusiform and aciculate, with its apex (in ♂) often pale; remaining segments very strongly compressed, with only the acute disc usually blackish; ♂ valvulæ large and exserted; terebra as long as the two basal segments or rather more than half the abdominal length, spicula deflexed. *Legs* slender and flavidous. *Wings* broad and not ample, with the radix, tegulæ and stigma testaceous, the nervures hardly darker; second recurrent broadly fenestrate above, hardly longer than the submarginal nervure and close to it; basal nervure not continuous; nervellus a little curved but not geniculate.

Fig. 148.
Tarytia flavo-orbitalis, Cam.

Length 4½–8 millim.

Bengal: Pusa, viii. and ix., and Chapra, vii. (Pusa coll.), Katihar, x. 07 (Ind. Mus.); Bombay: Deesa, x. 98 (*Col. Nurse*, type), Surat, x. (Pusa coll.); Madras: Quilon, Travancore, xi. 08 (*N. Annandale*); Ceylon: Trincomali, ix. 09, and Peradeniya, x. 09 (*E. E. Green*): Burma: Bhamo, vii. 86 (*L. Fea*).

Type in Col. Nurse's collection.

Specimens have been taken by Mr. C. Paiva, of the Indian Museum, on board-ship, four miles off Tuticorin, 25. v. 08, and ten miles off Coconada, Madras coast, 17. iv. 08.

At once recognised from Cameron's four other species by the second recurrent being emitted from the external cubital nervure at an appreciable distance further from the base of the wing than the submarginal nervure, though he failed to note this distinction. The black and aciculate two basal segments are very distinctive. I am strongly of opinion that this species should be transposed to *Cremastus* on account of the analogous neuration; but the metanotum is somewhat more produced than is usual in that genus and its facies is altogether similar to that of *Tarytia*.

This appears to be an extremely common species in Bengal and there is a very long series in the Pusa collection, the majority of which were bred from the Pyralid leaf-rolling caterpillar of *Antigastra catalaunalis*, Dup. It is also represented by specimens raised from the Tortricid, *Eucosma paragramma*, Meyr., the Pyralids, *Chilo simplex*, Butl., *Euzophora perticella*, Rag., and the larva of another undetermined Pyralid, feeding on *Acacia arabica*.

Tribe *PRISTOMERIDES*.

This tribe is instantly recognised from the remainder of the OPHIONINÆ by the usually strong and elongate hind femoral tooth, followed by a series of serrations in the typical genus or close to the apex in *Pristomeridia*, Ashm.; and this allies it to the Pimplid genus *Odontomerus*, Grav., though they have hardly another feature in common. It is closely related to CREMASTIDES in the large stigma, broad wings, and single elongate submarginal nervure.

The only species of this tribe hitherto recorded from India was placed by Cameron in *Pristomeridia*, but from his account of the subapical serrations of the hind femora it is obvious that it should be referred to the following genus, though his description of the metanotum is too vague to determine the shape of the areola.

This tribe is universally distributed, since Tosquinet has described several kinds from Africa and Cresson others from America, but the known species are very few in number, hardly amounting to a dozen in all.

Genus **PRISTOMERUS**, *Curtis*.

Pristomerus, Curtis, Brit. Ent. 1836, fol. 624.

GENOTYPE, *Ichneumon vulnerator*, Pz.

Head narrow on the vertex; clypeus slightly demarcated and apically broadly rounded; mandibular teeth of subequal length; eyes of ♀ hardly, of ♂ strongly, convergent above; ocelli subcontiguous to the eyes. Antennæ not extending beyond the postpetiole, flagellum generally subattenuate basally. Thorax

with the metanotal areæ more or less complete; areola hexagonal, apically entire, with the costulæ strong. Basal abdominal segment apically somewhat broad, with distinct glymmal sulci; second segment with the epipleuræ inflexed; terebra slender and exserted. Legs not very slender; hind femora stout, with a strong oblique tooth slightly beyond the centre, followed by small subcrenulate processes; hind calcaria of unequal length; fifth tarsal joint longer and a little broader than the fourth, with the short claws pectinate. Wings with the stigma large and broad; areolet entirely wanting; discoidal cell not elongate, but with its lower external angle subacute; lower wings with the median nervure not basally obsolete, nervellus subgeniculate below its centre.

Range. World-wide.

The species of this very distinct genus are known to prey upon various small Tortricid and Gelechiid moths, and I once bred numbers in a room of stored apples, where they emerged, in all probability from the codlin moth (*cf.* Zoologist, 1909, p. 213) though not elsewhere recorded as a parasite of this species.

Table of Species.

1 (2) Black; third segment aciculate .... *marginicollis*, Cam.
2 (1) Testaceous; third segment not at all aciculate .... *testaceus*, sp. n.

400. **Pristomerus marginicollis**, *Cam.*

Pristomeridia marginicollis, Cameron, Tijds. Ent. 1907, p. 110 (♀).

♀. A black species, with very variable yellowish and testaceous markings. *Head* with the inner orbits narrowly, and the strongly though sparsely punctate clypeus, testaceous; face closely, regularly, and somewhat strongly punctate, with the epistoma circularly prominent; frons and vertex dull and alutaceous. *Antennæ* black, with the scape and two basal flagellar joints entirely testaceous. *Thorax*: pro- and mesothorax closely punctate; pronotum transversely flavidous; "base of metanotum strongly transversely punctured; in the centre of the base are two stout, somewhat curved inwardly keels; on the apex are two longer straight keels extending from shortly beyond the middle to the apex; the apical slope is bordered by a stout keel which is curved down in the middle; the slope is stoutly transversely striated, the striæ roundly curved"; propleuræ centrally striate and impressed, with a broad and parallel-sided flavidous line below; mesopleuræ

Fig. 149.
Pristomerus marginicollis, Cam.

apically glabrous and nitidulous above. *Scutellum* glabrous and nitidulous, with its apex finely and longitudinally aciculate; postscutellum closely and distinctly striate. *Abdomen* rufescent, with the two basal segments apically and ventrally, and the basal half of the first, flavidous; third basally black in the centre; apical half of first segment and whole of the second except their apices, as well as the base of the third centrally, finely and closely aciculate; terebra 2 millim. in length. *Legs* flavidous, with the hind coxæ, except apically, black; hind femora rufescent, their tibiæ subconcolorous and their tarsi dark; hind femora serrate between their apices and the elongate, oblique teeth. *Wings* hyaline; tegulæ flavidous, stigma and nervures black; submarginal nervure slightly more than half the length of the space bounded by it and the recurrent nervure.

Length 6–9 millim.

♂. I have seen a ♂, which appears to belong almost undoubtedly to this species. From the above ♀ it differs only in having the inner orbits immaculate, the epistoma hardly convex, mandibles and whole of the prothorax pale testaceous, sides of scutellum narrowly but conspicuously concolorous; apical half of first abdominal segment and the whole of second, except laterally at base, black; genital valvulæ exserted and apically truncate; hind tarsi flavous, with the onychii alone dark, and the submarginal nervure about as long as the space between it and the second recurrent nervure. The last is the only feature of much note in these divergences, though the locality is distant.

Length 6 millim.

RAJPUTANA: Mt. Abu (*Col. Nurse*, ♂); UNITED PROVINCES: Mussoori, vi. (*E. Brunetti*—Ind. Mus.); SIKKIM (*Col. Bingham*); BENGAL: Calcutta (Ind. Mus.); ASSAM: Margherita (Ind. Mus.), Shillong, v. 03 (*Turner*); TENASSERIM: Mergui (*W. Doherty*—Ind. Mus.); CEYLON (*Thwaites*—Oxf. Mus., ♂).

I am not entirely satisfied that the present species is indeed distinct from the well-known *P. vulnerator*, Grav.; the above sexes differ somewhat in coloration, and further, the ♂ from Mt. Abu has the head mainly and the thorax entirely bright red, with the legs nearly entirely black, yet I can trace no structural distinctions, in the absence of which it is idle to consider it a new species. *P. vulnerator* is known to range throughout nearly the whole of Europe, and quite possibly extends to Asia.

401. **Pristomerus testaceus**, sp. n.

♂ ♀. A pale testaceous species with only the mandibular apices, the claws, apex of first and disc of second segment, and occasionally the frons and occiput (except their orbits), black; antennal flagellum (except basally) and anus subinfuscate. *Head* with face nitidulous and distinctly punctate, epistoma tuberculiformly prominent; scrobes large and extending nearly to ocelli, separated by a carina. *Antennæ* extending to apex of postpetiole. *Thorax* nitidulous,

finely punctate, the mesothorax and metapleuræ more distinctly so; notauli deeply impressed; basal area small and subquadrate; areola very elongate, hexagonal, and twice as long as broad, with the costulæ entire and emitted at the basal third; petiolar area discrete, trans-aciculate, basally strong and internally parallel-sided. *Scutellum* glabrous and subdeplanate, with no lateral carinæ. *Abdomen* somewhat dull and closely alutaceous, with the anus pilose; basal segment linear nearly to its centre, and thence gradually a little widened and finely aciculate to apex; second slightly shorter, dull and finely aciculate throughout; genital valvulæ pale and very slightly exserted; terebra very slender, and slightly shorter than the abdomen. *Legs* with the hind femoral tooth flavous. *Wings* hyaline, with the radix and tegulæ fulvous, stigma a little darker; submarginal nervure very slightly longer than its distance from the recurrent; nervellus geniculate, but not intercepted, distinctly below its centre.

Length 7–8 millim.

The ♀ has the basal half of the second and third abdominal segments alone discally blackish.

BENGAL: Chapra (*Mackenzie*, type); CENTRAL PROVINCES: Nagpur (Pusa coll.); MADRAS: Attur (Pusa coll.), Kulattupuzha, in Travancore, xi. 08 (*N. Annandale*).

Type in the Pusa collection.

Specimens in the Pusa collection have been bred from the Pyralid moths, *Euzophora perticella*, Rag., and *Leucinodes orbonalis*, Guen.

Genus PRISTOMERIDIA, *Ashm.*

Pristomeridia, Ashmead, Proc. U.S. Nat. Mus. 1900, p. 100.

GENOTYPE, *Porizon agilis*, Cresson.

This genus was differentiated from *Pristomerus* by its entire and not geniculate or intercepted nervellus, pentagonal and not hexagonal areola, the scarcely thickened hind femora, the tooth of which is near the apex and not merely slightly beyond the centre. It was erected for the reception of a single species, described from Texas by Cresson (Trans. Amer. Ent. Soc. 1872, p. 175), and referred by him, with some hesitation, to the genus *Porizon*. Our Indian insect certainly belongs here, though the areola is hexagonal and the femoral tooth is at some distance from the apex.

Range. Nearctic Region, India.

402. Pristomeridia secunda, sp. n.

♀. A small, black species, with the legs, abdomen, and antennæ partly pale. *Head* a little broader than the thorax, with the vertex transverse and the confluent scrobes trans-aciculate above the antennæ; eyes internally entire and parallel; face shining, distinctly punctate, and a little elevated centrally; clypeus discrete,

apically broadly rounded, strongly transverse and, like the strong mandibles, entirely testaceous, the latter with the lower tooth longer. *Antennæ* broken, broadly separated and black, with the scape and the three elongate basal flagellar joints testaceous. *Thorax* shining and distinctly punctate; notauli entire and deeply impressed; sternauli basally strong and elongate; metathorax with complete, though not strong, areæ; areola hexagonal, half as long again as broad, and emitting the costulæ nearly from its base; basal area very small; petiolar area trans-strigose, discrete and basally bisinuate; spiracles small. *Scutellum* black and subconvex. *Abdomen* black, with the anus indefinitely paler; two basal segments deplanate and finely aciculate, the remainder very strongly compressed and subglabrous; the first basally petiolate, with its spiracles but slightly beyond the centre; terebra two-thirds the length of the abdomen and apically sinuate. *Legs* slender and testaceous, with the hind femora a little darker; hind tibiæ flavescent, with their apices and a subbasal mark infuscate; hind femoral tooth minute but distinct, followed by no serration. *Wings* hyaline and not narrow; radix and tegulæ testaceous, stigma luteous and large; submarginal nervure shorter than its distance from the second recurrent; basal nervure continuous; lower wing with the median nervure strong to base, the recurrent longer than the basal abscissa of the radius, and the straight nervellus not geniculate or intercepted; remaining nervures obsolete.

Length nearly 5 millim.

United Provinces: Bhanwar, Gonda district, xi. 07 (type); Central Provinces: Saugor (Pusa coll.).

Type in the Indian Museum.

Tribe *PORIZONIDES.*

This tribe is very easily recognised by its triangular radial cell, the very broad stigma, and comparatively small abdomen; no hesitation can be experienced respecting its members if it be borne in mind that, in addition to the above features, the median nervure of the hind wings is entirely wanting between the nervellus and the base, and that in the front wing the basal nervure is very distinctly thickened at its point of junction with the costa, forming an often not inconspicuous pseudostigma. The two latter points at once distinguish it from the Pristomerides, Cremastides, and Plectiscides, while from the remainder of the Ophioninæ the large and broadly triangular stigma and not apically produced metathorax render it very different.

It has been subdivided into a score of genera, for the most part of doubtful stability, of which only two have hitherto been noticed in our fauna, no doubt owing rather to the lack of observation and collection of such small insects than to the absence or rarity of specimens.

Table of Genera.

1 (2) Calcaria normal and curved; hind tarsi elongate, with all the joints gradually decreasing in length; thorax cylindrical	PORIZON, Fln., p. 512.
2 (1) Calcaria short and straight; hind tarsi with basal joint much longer than the following; thorax short and convex	DIAPARSIS, Först., p. 514.

Genus **PORIZON**, *Fln.*

Porizon, Fallén, Specim. Hym. 1813, p. 18; Holmgren, Sv. Ak. Handl. 1858, p. 132.

GENOTYPE, *Porizon hostilis*, Grav.

Head with the maxillary palpi quadri-articulate and the orbits not pale. Antennæ often apically attenuate, with the flagellum multi-articulate. Thorax generally cylindrical and much longer than high; sternauli always distinct; metathorax with no costulæ or lateral carinæ; basal area rarely entire; petiolar area not extending beyond centre. Abdomen short, with the petiole stout and sometimes discally excarinate; second segment not transverse, with large and triangular thyridii; terebra reflexed and usually stout. Hind femora simple and somewhat slender; calcaria curved; hind tarsi elongate, with the joints gradually decreasing in length to apex. Stigma broad and generally emitting the radius beyond its centre; areolet not entire, obsolete or wanting, with the submarginal nervure very short; anal nervure not arcuate, emitted from below centre of brachial cell; basal nervure subtriangularly thickened at the costa; radial cell with its lower angle subacute; nervellus not geniculate; basal abscissa of radial nervure in lower wing equal in length to the recurrent nervure.

Range. Most of the species of this genus are Palæarctic or Nearctic, though a few have been found in Cuba, &c., and their rarity in the tropics is probably due simply to want of observation. Only three Indian specimens have passed through my hands.

Table of Species.

1 (2) Mesonotum with four oblong marks, and head mainly, testaceous	*pallidipes*, Mots.
2 (1) Mesonotum black; head with mouth alone testaceous	*meridionalis*, sp. n.

403. **Porizon pallidipes**, *Mots.*

Porizon pallipes, Motschulsky, Bull. Soc. Nat. Moscou, xxxvi, 1863, p. 29 (♂).

An elongate, shining, very finely punctulate and very shortly pilose, black species, with the head (except centrally), the pronotum laterally, and four oblong central marks, the mesonotum,

and the legs, pale testaceous; the abdomen beneath and the base of the antennæ infuscate testaceous; the wings subinfumate, with the nervures and stigma black; the abdomen nearly sessile, narrow, with its underside concavely depressed and the segments very narrowly margined with red; the hind femora basally, and the coxæ and apices of the tibiæ piceous.

Length about 5 millim.

CEYLON: Nuwara Eliya (*teste* Motschulsky).

I can do no more than reproduce Motschulsky's description, as no one has mentioned the species since his time, and I have seen no individuals that could be referred to it; he only adds that the breadth of the head is one-sixth the length of the body.

404. **Porizon meridionalis**, sp. n.

♂ ♀. A black species, with the abdomen, tegulæ, scape, and legs more or less broadly red. *Head* narrow and very strongly transverse, black, with the glabrous clypeal apex, the elongately bidentate mandibles, and the palpi, red; vertex very narrow, with distinct and even punctures extending to the circularly subprominent epistoma, thence becoming subconfluent laterally and a little finer apically to base of the subdiscrete and apically unevenly rounded clypeus. *Antennæ* quite filiform and hardly longer than the head and thorax, black, with the scape ochraceous; flagellar joints subpilose and well discrete. *Thorax* immaculate black and hardly longer than high; mesonotum dull and closely punctate, with somewhat strong but indefinite notauli, coalescing discally; metathorax very short, with a strong and discrete petiolar area; lateral carinæ strong; spiracles small, circular, and facing upwards. *Scutellum* black and dull. *Abdomen* glabrous and nitidulous, nearly double the length of the head and thorax, red; in ♀ with the whole first and extreme base of the second segment black, in ♂ with the whole first and the base of all the following segments broadly black; basal segment glabrous and nitidulous, with elongate petiole and the spiracles distinctly beyond its centre at the strong subapical arcuation; thyridii distinct; terebra shorter than the abdomen. *Legs* not elongate or determinately rufescent; hind coxæ, and in ♂ their femora, blackish. *Wings* broad and somewhat short, hyaline, with the broad stigma black and the tegulæ rufescent; radial cell trapeziform, areolet wanting; second recurrent nervure fenestrate above and emitted slightly beyond the submarginal; basal nervure not continuous through the median; neuration of lower wings very weak, with the nervellus not interrupted, subopposite and quite straight.

Length 5–6 millim.

BURMA: Karen Hills, 3000–3700 ft., viii. 88 (*L. Fea*).

Type in the Genoa Civic Museum.

Described from a single pair. A small female, in very bad condition, in the Oxford Museum, appears to belong to the same species; it was taken by Dr. Thwaites in Ceylon in 1872.

Genus DIAPARSIS, *Först.*

Diaparsis, Förster, Verh. pr. Rheinl. 1868, p. 149.
Diaparsus, Thomson, Opusc. Ent. xiii, 1889, p. 1369.

GENOTYPE, *Ophion nutritor*, F.

Head a little constricted behind the eyes, with the vertex not smooth; frons usually transversely elevated; cheeks not very short; face strongly transverse. Antennæ of ♀ with at least twenty flagellar joints, of which the first is generally longer than the second, and not or hardly transverse. Thoracic notauli short but distinct; metanotum with the basal area not short and very rarely with a basal carina; sternauli always distinct, though occasionally abbreviated. Abdomen with the second segment longer than broad, and the first not often strongly convex; terebra exserted and usually elongate; thyridii elongately triangular. Calcaria not very small. Wings with the lower angle of the brachial cell entire; apical abscissa of radius not deflexed, and always at least twice the length of the basal.

Range. Europe, Assam.

No example of this genus has hitherto been noticed outside Europe, for which the inconspicuous size of its species probably accounts.

405. Diaparsis caudata, sp. n.

♀. *Head* distinctly broader than the thorax and subbuccate above; frons broad and eyes not large; clypeus discrete and apically rounded; mandibles stout and red. *Antennæ* black, not reaching beyond the metathorax, with about twenty-six well discrete flagellar joints; scape rufescent beneath. *Thorax* dull and finely pilose; sternauli elongate and deeply impressed; metathorax elongate and not rugulose, with no carina at the basal area; petiolar area slightly longer than half the metathorax, and basally strongly carinate throughout; spiracles circular and somewhat remote from the pleural carina. *Scutellum* black and convex. *Abdomen* bright red, with the spiral valvulæ, the basal segment, and the extreme base and apex of the second indefinitely, black; basal segment intumescent from beyond centre to apex, with the spiracles beyond centre and not prominent; terebra straight, sinuate only at its extreme apex, and fully as long as the body. *Legs* red and not stout, with the hind coxæ,

Fig. 150.—*Diaparsis caudata*, Morl.

femora and tibiæ black or blackish; hind femora and tibiæ not thickened, with the basal joint of their tarsi shorter than the two following united. *Wings* hyaline, with the radix and tegulæ ochraceous, stigma and nervures piceous; fenestræ small and punctiform; radial cell elongate, with the submarginal nervure not very short; second discoidal cell apically entire; median nervure of lower wing basally obsolete; nervellus nearly straight and not geniculate.

Length 5 millim.

ASSAM: Shillong, 6000 ft., v. 03 (*Rowland Turner*).

Type in the British Museum.

This species appears to belong to Förster's subgenus *Temelucha*, on account of the structure of the maxillary palpi. It is at once known from its allies in having the terebra fully as long as the apically rufescent abdomen, whereas in *D. erythrostoma*, its nearest ally, the anus is black; superficially it has much the facies of the common Palæarctic *D. versutus*, Holmg.

Tribe *MESOCHORIDES*.

The genus *Mesochorus* of Gravenhorst, Ratzeburg and Holmgren, has been raised by recent authors to the rank of a subfamily and its species distributed through four not very sharply defined genera. It is very readily recognised from the whole remainder of the ICHNEUMONIDÆ, however, by the peculiar shape of the alar areolet, which is obliquely square, that is to say that it has the angles at the top, bottom and either side, in place of two on the radial nervure and two below as in certain CRYPTINÆ. To the latter it bears some analogy in its mainly deplanate abdomen, the first segment of which has its spiracles at or behind the centre, never before it as in most OPHIONINÆ. Its true position is still uncertain. Ashmead was, I believe, the first to notice its relationship with *Paniscus*, though he places it next the BANCHIDES. He remarks that "the abdomen in the males terminates in two long, slender spines, a character found in no other tribe"; and this peculiarity, together with the obliquely subquadrate areolet described by me under the Paniscid genus *Tetragonalys* (*ante*, p. 360) goes to confirm Ashmead's opinion and to establish the position of the present tribe.

The MESOCHORIDES are parasitic on both Lepidoptera and Hymenoptera, and have been bred from Chrysomelid and Curculionid beetles, but are most often met with in the injurious capacity of hyperparasites, through the beneficial Braconids of the subfamily MICROGASTERINÆ, of noxious caterpillars. Little attention has been accorded this group of small insects in India: and, in fact, the difficulty of their study on account of their microscopic distinctions has caused them to be much neglected even in those countries where ICHNEUMONIDÆ have been most closely worked.

Table of Genera.

1 (4)	Metathoracic spiracles subcircular; areolet quadrate.	
2 (3)	Anal nervure emitted from centre of brachial cell; nervellus geniculate. .	Astiphromma, Först., [p. 516.
3 (2)	Anal nervure emitted above centre of brachial cell; nervellus entire . .	Mesochorus, Grav., p. 517.
4 (1)	Metathoracic spiracles elongate; areolet rhomboidal	Edrisa, Cam., p. 520.

Genus ASTIPHROMMA, *Först.*

Astiphromma, Förster, Verh. pr. Rheinl. 1868, p. 170.
Astiphrommus, Thomson, Ann. Soc. Ent. France, 1886, p. 327.

Genotype, *Mesochorus scutellatus*, Grav.

Head with the genal sulcus wanting; frons entirely and face often black, the latter never with the orbits alone determinately pale and in ♂ always pale throughout. Lateral thoracic carinæ often basally obsolete. Abdomen subpilose discally, with the postpetiole margined in both sexes. Upper wings with the lower basal nervure usually postfurcal and the anal emitted from the centre of the second discoidal cell, which is externally acute below. Hind wings with nervellus nearly always geniculate.

Range. United States, Europe, Ceylon.

This genus differs from *Mesochorus* in possessing genal sulci, in its geniculate or intercepted nervellus, and in the anal nervure not being emitted from above the centre of the first recurrent; in the last character it agrees with *Stictopisthus*, Thoms. (entirely overlooked by Ashmead in 1900), which has the nervellus entire and not intercepted.

406. **Astiphromma petiolata**, sp. n.

♀. A very small, shining black species, with the prothorax

Fig. 151.—*Astiphromma petiolata*, Morl.

and base of antennæ testaceous; clypeus, palpi and legs flavous; the coxæ, tegulæ and third abdominal segment substramineous;

apex of hind trochanters, of their tibiæ and tarsal joints, faintly infuscate; antennæ slender, filiform and nearly as long as the body; two basal abdominal segments very strongly aciculate, the first somewhat strongly dilated, with the spiracles distinctly beyond its centre; terebra not extending beyond the anus, which is compressed from the base of the fourth segment. Stigma subinfuscate; areolet small, distinct, subcircular and elongately petiolate, emitting the recurrent nervure from near its apex; radius angled above the areolet, short and hardly extending further than the broadly curved second recurrent nervure; internal cubital nervure evenly curved throughout; basal nervure continuous; lower wings with the recurrent as long as the basal abscissa of the radius, and the nervellus distinctly intercepted, though less distinctly geniculate, at its lower third.

Length 3 millim.

Ceylon: Peradeniya, v. 09 (*E. E. Green*).

Type in the author's collection.

The elongately petiolate areolet and very small size distinguish this insect from any of the Palæarctic species, though perhaps it may be placed near *A. varipes*, Holmg. (*cf.* Thoms. *l. c.* p. 329).

I have seen two specimens, one of which was taken by sweeping *Crotalaria striata*.

Genus **MESOCHORUS**, *Grav.*

Mesochorus, Gravenhorst, Ichn. Europ. ii (1829), p. 960.

Genotype, *M. splendidulus*, Grav.

A genus of fragile and usually very small insects, for the most part of a luteous or flavescent coloration and often more or less indefinitely marked with black, always strongly nitidulous, with the abdomen strongly convex rather than laterally compressed; the females always have the terebra exserted and the males their anal styles very prominent, rendering them liable to be mistaken for the opposite sex. From the allied genera the position of the junction between the anal nervure and first recurrent of the front wing will serve to distinguish them in the present state of our knowledge.

Range. North America, Europe, Sikkim, Assam, Burma.

Table of Species.

1 (2) Areolet sessile; basal nervure postfurcal	*facialis*, Bridg., p. 518.
2 (1) Areolet petiolate; basal nervure continuous through the median.	
3 (4) Stigma unicolorous stramineous; thorax entirely pale	*fragilis*, sp. n., p. 519.
4 (3) Stigma hyaline at both extremities; thorax partly black	*claristigmaticus*, sp. n., [p. 519.

407. **Mesochorus facialis**, *Bridg.*

Mesochorus facialis, Bridgman, Trans. Ent. Soc. Lond. 1884, p. 431; Thomson, Ann. Soc. Ent. France, 1886, p. 343 (♂ ♀).

♂ ♀. A small testaceous red species, with sparse markings and the hind tibiæ at both base and apex, black. *Head* testaceous, with the mandibular apices, and sometimes the occiput, alone black; ocelli not large; frontal orbits not white. *Antennæ* with the flagellum slender, filiform and infuscate. *Thorax*: mesonotum entirely, or with two or three discal stripes, black; metanotum with its basal half black; areola exactly hexagonal, a little longer than broad, emitting the costulæ from its centre; petiolar area not extending to centre of metathorax and basally rounded. *Scutellum* with no apical tubercle, testaceous, with its frenum black. *Abdomen* glabrous and nitidulous, compressed from base of third segment; black, with base of first and third segments, apical half of second, and anus narrowly, testaceous; postpetiole sometimes distinctly aciculate, though usually glabrous and always with its spiracles central; second segment transverse and strongly dilated apically; terebra straight and somewhat slender, black, and as long as the second segment; ♂ valvulæ flavous and elongately exserted. *Legs* testaceous, with the hind femora subfulvidous; hind tibiæ black at both base and apex, with the tarsi blackish and the coxæ externally subinfuscate; hind calcaria shorter than half the metatarsus; claws and pulvilli minute. *Wings* with the areolet exactly quadrate, sessile and not broader than the length of the recurrent nervure; stigma infuscate; lower basal nervure very distinctly postfurcal; radius regularly curved throughout; nervellus oblique, straight, and not intercepted.

Fig. 152.—*Mesochorus facialis*, Bridg.

Length 4–4½ millim.

BENGAL: Pusa, Chapra (*Mackenzie*—Pusa coll.); ASSAM: Sadiya (Ind. Mus.), Khasi Hills (Pusa coll.). EUROPE.

Type in the Norwich Castle Museum.

The Indian examples I have seen differ from Bridgman's description only in having the postpetiole aciculate; specimens from the same brood as the type, given me by Bignell, bear no trace of aciculation. One of the former, too, has the mesonotum entirely black.

This species has hitherto been known only from Britain, Sweden, and Denmark. It is known to be hyperparasitic, through the Braconid, *Apanteles popularis*, Hal., on *Euchelia*

jacobeæ, L., in England, as stated by the Rev. T. A. Marshall ('Braconides d'Europe,' i, p. 476), and a male was bred at Pusa from the Noctuid moth, *Ophiusa melicerta*. In the Calcutta Museum are three males, together with some forty *Apanteles* cocoons, whence they had emerged, on a leaf, labelled "Ichneumons of *Adolias garuda*," but with no locality.

408. **Mesochorus fragilis**, sp. n.

♂. A small, pale testaceous species, with the ocellar region alone black; stigma unicolorous stramineous; basal nervure continuous through the median; areolet subpetiolate.

Length 3½ millim.

TENASSERIM (*W. Doherty*).

Type in the Indian Museum.

This species so closely resembles *M. facialis* in every particular that I should certainly have considered it nothing but a pale form, were it not that the basal nervure is quite continuous through the median and the areolet somewhat distinctly less sessile; in coloration, however, it is altogether paler, having the ocellar region alone black, with the thyridii of the second and apex of the third segment slightly infuscate; the second segment is a little longer than broad, the hind tibiæ are immaculate and the stigma pale stramineous.

Described from a single male.

409. **Mesochorus claristigmaticus**, sp. n.

♀. A somewhat small, indefinitely black and testaceous species, with the basal nervure continuous, the areolet subpetiolate and the stigma basally hyaline. *Head* rufescent testaceous, with the ocellar region and mandibular apices black; ocelli not large, nor the frontal orbits white. *Antennæ* slender, filiform and pale throughout. *Mesonotum* finely punctate and testaceous, with its sides subinfuscate; meso- and pro-pleuræ and prosternum blackish, with distinct sternauli; metapleuræ black; metanotum clear red, with the areola hexagonal, twice as long as broad, emitting the costulæ distinctly before its centre, and gradually constricted basally; basal area wanting; petiolar area not extending to centre of metathorax, basally rounded and finely discrete; spiracles circular, not small, remote from the entire lateral carinæ and facing upwards. *Scutellum* testaceous and (apparently) apically tuberculate. *Abdomen* glabrous and nitidulous, with the slender basal segment subaciculate before its apex, and compressed from the third segment; rufescent testaceous, with the anus and sides of the second and third segments dark; basal segment a little widened from the subprominent spiracles, and the second distinctly a little longer than apically broad; terebra straight and not slender, black and as long as the second segment. *Legs* testaceous; the anterior femora and tibiæ, with the hind tibiæ (except their deep black apices), flavescent; hind calcaria exactly

half the length of the metatarsus; claws and pulvilli minute. *Wings* with areolet distinctly broader than high, subpetiolate and about as broad as the length of the recurrent nervure; stigma pale brunneous, with its base broadly, and apex very narrowly, clear hyaline; basal nervure continuous through the median; radius regularly curved throughout; nervellus suboblique, straight and not intercepted.

Length 4 millim.

SIKKIM: Darjiling, ix. 08 (*E. Brunetti*).

Type in the Indian Museum.

The peculiar clarity of the stigma will at once distinguish this species.

Described from a single female; but Stebbing has more recently bred a probably conspecific, but badly broken, individual from an oak-feeding Lasiocampid moth at Drobun in the United Provinces.

Genus **EDRISA**, *Cam.*

Edrisa, Cameron, Tijds. Ent. 1907, p. 111.

GENOTYPE, *E. pilicornis*, Cam.

Head with the clypeus not discrete, ocelli not approximating the eyes, temples broad and obliquely constricted, occiput rounded inwardly. Antennæ slender and elongate, shortly and densely pilose. Thorax with no notauli, and sternauli extending to centre of mesosternum; metanotum regularly areated, with the petiolar area somewhat elongate-triangular and carinately connected with the elongate-cordate areola; spiracles short-oval, about twice as long as broad. Scutellum circularly convex. Abdomen glabrous and nitidulous; postpetiole subelongate and gradually widened throughout, with the spiracles shortly but distinctly beyond the centre of the excarinate basal segment; terebra short and broad. Legs with the tibiæ spinose, and tarsal claws small and simple. Areolet large and irregularly pentagonal, rhomboidal and distinctly narrowed in front, emitting the recurrent nervure at the apex of its basal third; basal nervure subcontinuous through the median; stigma gradually broadening towards the radial nervure, which is emitted near its apex; nervellus entire; radial cell elongate, narrow, extending to near apex of wing.

Range. Sikkim.

Its author says that this genus may be known from *Mesochorus*, Grav., by the longer and narrowed radial cell and stigma, by the completely areated metanotum, with its subelongate and not circular spiracles. The first of these characters is hardly generic, the second is entirely shared with *Mesochorus*, and Holmgren says the spiracles are sometimes subovate in the latter; I have not seen this genus and much doubt its distinction from *Mesochorus* as restricted by Thomson, since the shape of the areolet seems the only distinctive point.

410. **Edrisa pilicornis**, *Cam.*

Edrisa pilicornis, Cameron, Tijds. Ent. 1907, p. 112 (♀).

♀. A pale testaceous species, with black markings. *Head* pale, with the frons (except laterally), vertex and disc of occiput, black; face and clypeus strongly and closely punctate, with a central longitudinal and apically dilated carina; palpi and mandibles pale and pilose, with the teeth black. *Antennæ* black. *Prothorax* feebly and mesothorax more strongly and closely punctate; mesonotum black; mesopleuræ broadly glabrous in the centre; metanotum with ten areæ, of which five are large and apical, subrufescent, glabrous, with sparse pale pubescence and the base punctate; petiolar area broad, large and basally broadly rounded. *Scutellum* basally black. *Abdomen* black, with the base of the first segment ferrugineous, apical half and a quadrate spot at base of the second pale flavous; terebra one-fifth the length of the body. *Legs* yellowish testaceous, with the hind ones subrufescent; base of hind tibiæ narrowly, and their apices more broadly black. *Wings* hyaline, with the nervures and stigma black.

Length 5 millim.

SIKKIM (*Col. Bingham*).

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Fig. 1. *Acœnitus xanthorius*, Morl., p. 43.
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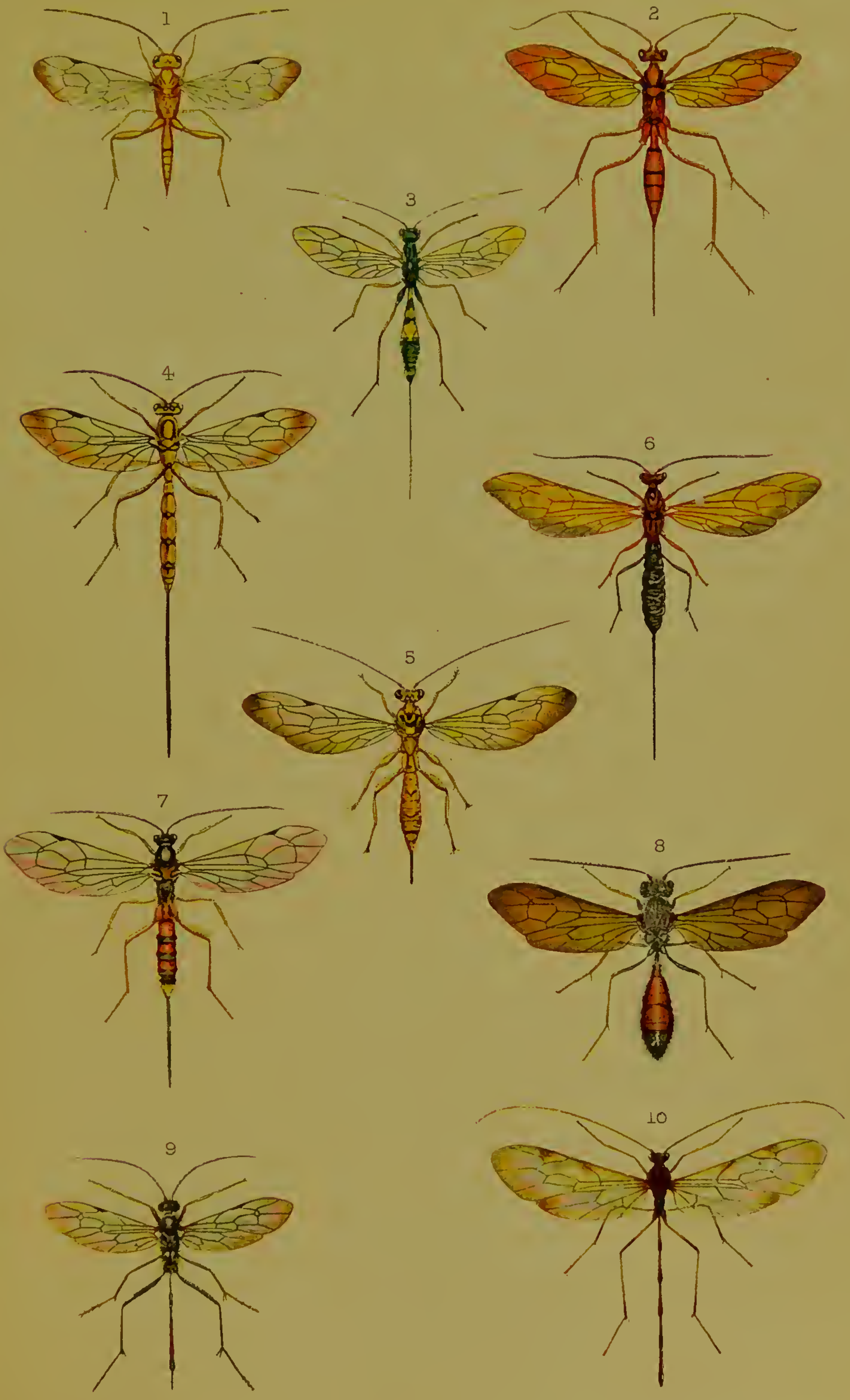

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